195

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Airline	25GSE-3062A, 25GSE-3063A, 25GSE-3081A Tel. Rec.	195-2
Airline	25WG-2758C, 25WG-2766A	195-3
Arvin	6213TM, 6215CB, CM (Ch. TE-319) Tel. Rec.	195-4
Brooks Labs.	ST-10	195-5
David Bogen	AM901	195-6
Don McGohan	MG-7	195-7
Emerson	716F, 717F, 719F, 727D (Ch. 120168-D) Tel. Rec., Prod. Chg. Bul. 61	195-1
Hoffman	21B116, 21B309, 21B701, 21M115, 21M308, 21M700, 21P310, 21P702 (Ch. 196, M, T) Tel. Rec.	195-8
Packard-Bell	2115, 2116 (Ch. 2115-2), 2117 (Ch. 2117) Tel. Rec.	195-9
RCA Victor	2-C-511, 2-C-512, 2-C-513, 2-C-514 (Ch. RC1118, A, B, C)	195-10
Regal	CR762	195-11
Wells-Gardner	317GS34C-218, -220, -278 Tel. Rec.	195-12
Zenith	K412G, R, W, Y (Ch. 4K01)	195-13

PROPERTY OF
L. E. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 190

Ch. 120168-D

Emerson Chassis 120168-D is identical to Chassis 120163-D covered in Photofact Folder 2 in Set 190 except for the following:

The two triode sections of V13, 12AU7 sync. amp. and horiz. sync. seperator, are reversed.

C1A and C1B have been replaced by one 80MFD section (Part # 925232).

A video test point was added to the top of the chassis. It connects to the junction of L26, R38 and C36.

A new horiz. AFC circuit is used in this chassis. A partial schematic of this circuit is given on the reverse side. Adjustment procedure for the new circuit is given below.

1. Turn the set on and tune in a TV station, preferable a test pattern.

2. Connect a short across the phasing coil L29 (the coil terminals are accessable from the top of the chassis on a terminal strip near V17 as shown below).

3. Short the horiz. control grid to chassis. (this point has been brought to the terminal strip on the top of the chassis also).

4. Rotate the horiz. hold control to the center of its mechanical range.

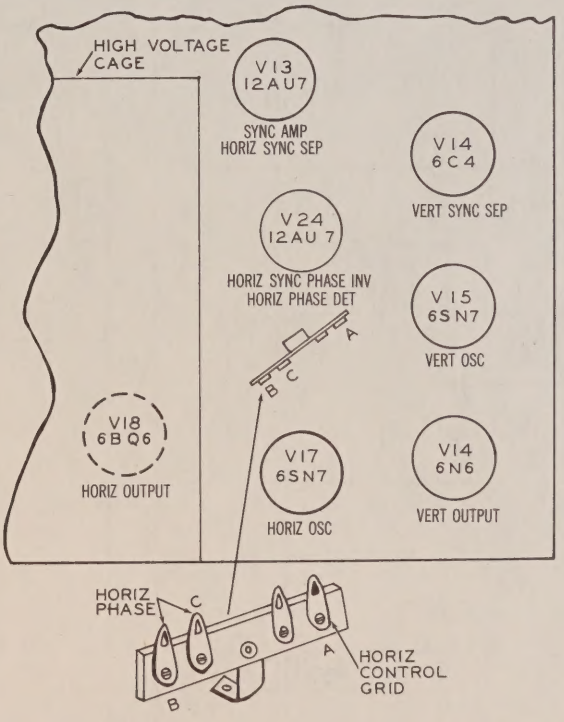
5. Adjust the horiz. balance control until picture synchronizes.

6. Remove the short from the horiz. phase coil (L29) and adjust horiz. phasing slug (B2) until picture synchronizes.

7. Remove short from horiz. control grid.

8. Remove signal by switching to another channel and back. If picture is out of sync. adjust B2 until picture locks into sync.

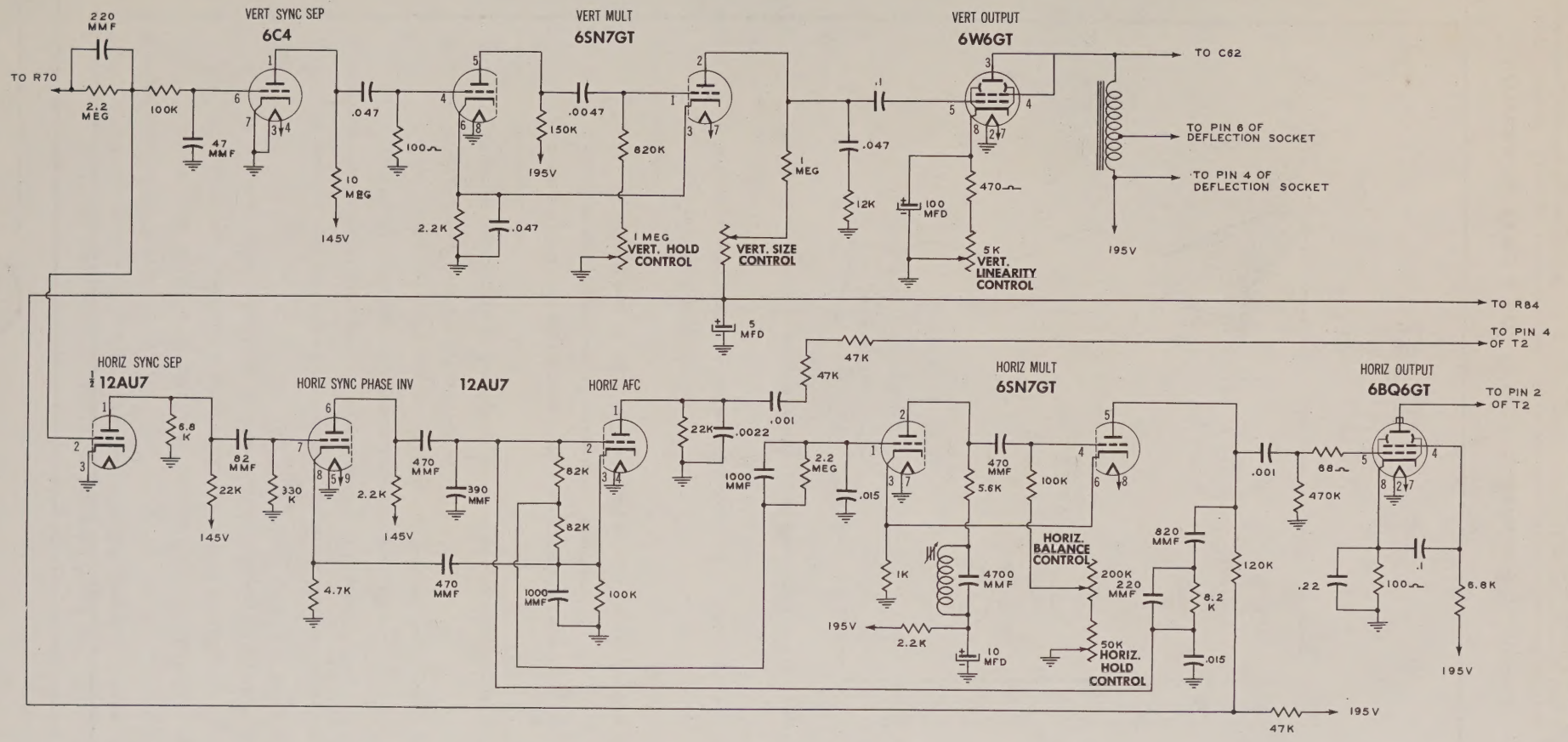
9. Check other channels as in step 8, readjusting B2 if necessary until sync. holds for each channel.



EMERSON MODELS 716F, 717F, 719F, 727D (Ch. 120168-D).

(Continued on Reverse Side)

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



EMERSON MODELS 716F, 717F, 719F, 727D (Ch. 120168-D).

PHOTOFACT* Folder

*TRADE MARK

RTMA MEMBER RADIO-TELEVISION MANUFACTURERS ASSOCIATION

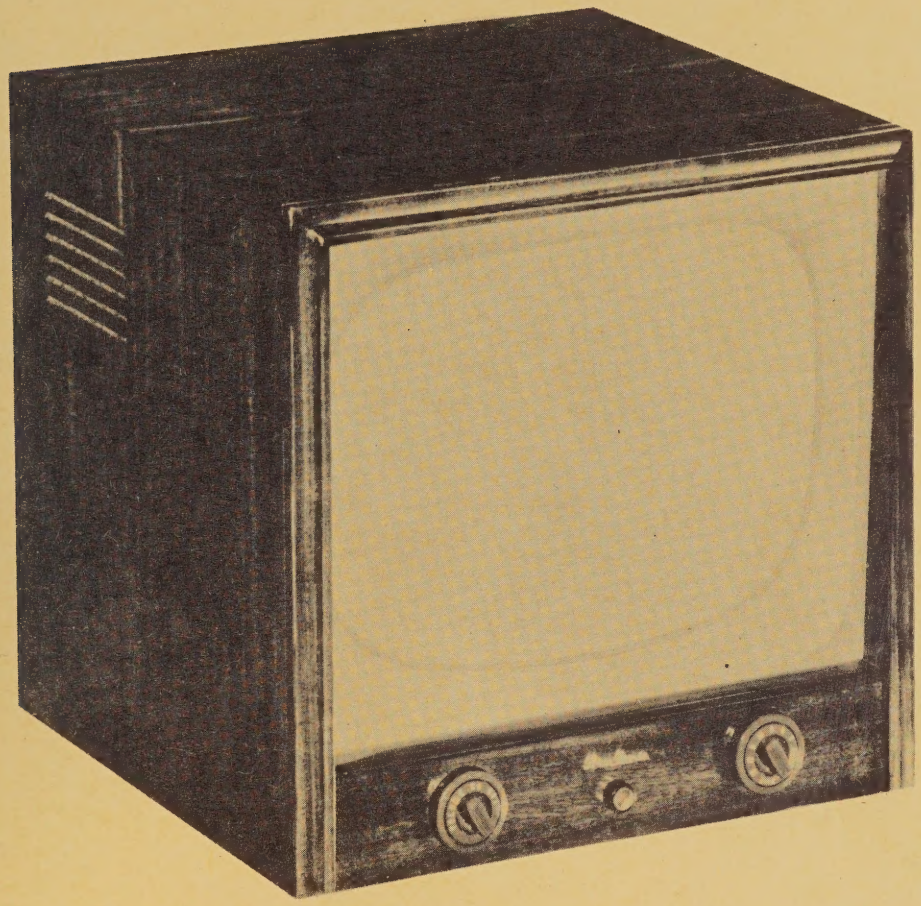
AIRLINE MODELS 25GSE-3062A, 25GSE-3063A, 25GSE-3081A

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 25GSE-3062A

AIRLINE MODELS 25GSE-3062A, 25GSE-3063A, 25GSE-3081A

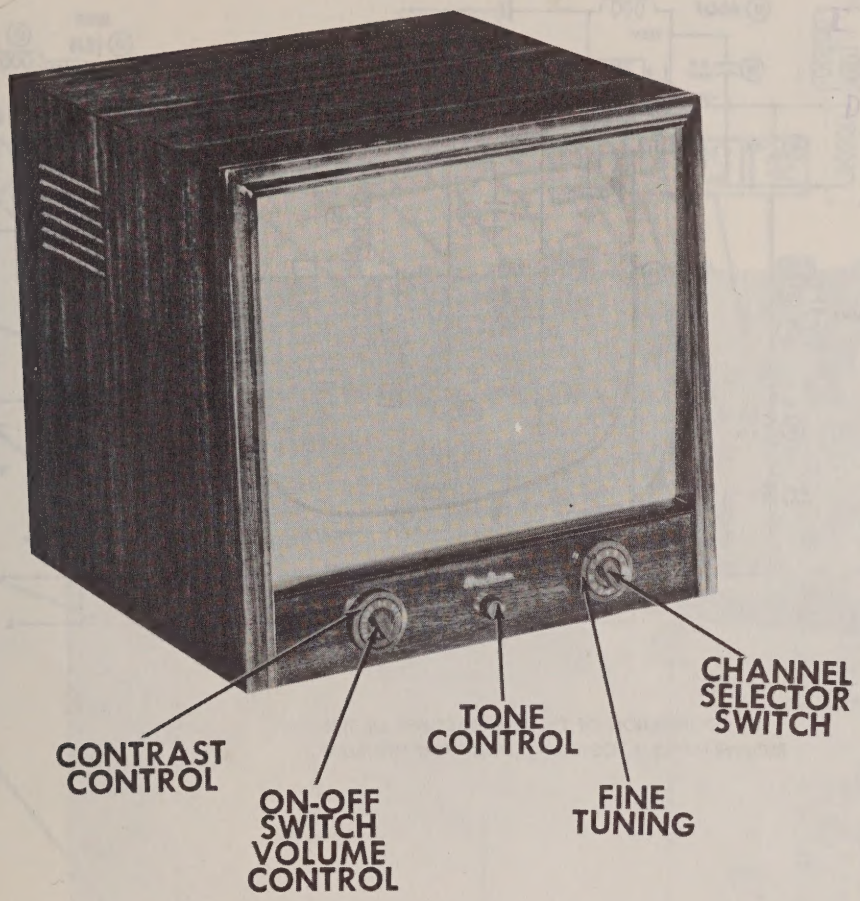
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2-53 SET 195 FOLDER 2

AIRLINE MODELS 25GSE-3062A, 25GSE-3063A, 25GSE-3081A

PROPERTY OF
C. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



AIRLINE 25GSE-3062A

TRADE NAME	Airline Models 25GSE-3062A, -3063A, -3081A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Eighteen

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.54 Amp. @ 117 Volts AC
TUNING RANGE-Channels 2 thru 13, Video IF 26.4MC, Sound IF 21.9MC (Intercarrier)

INDEX

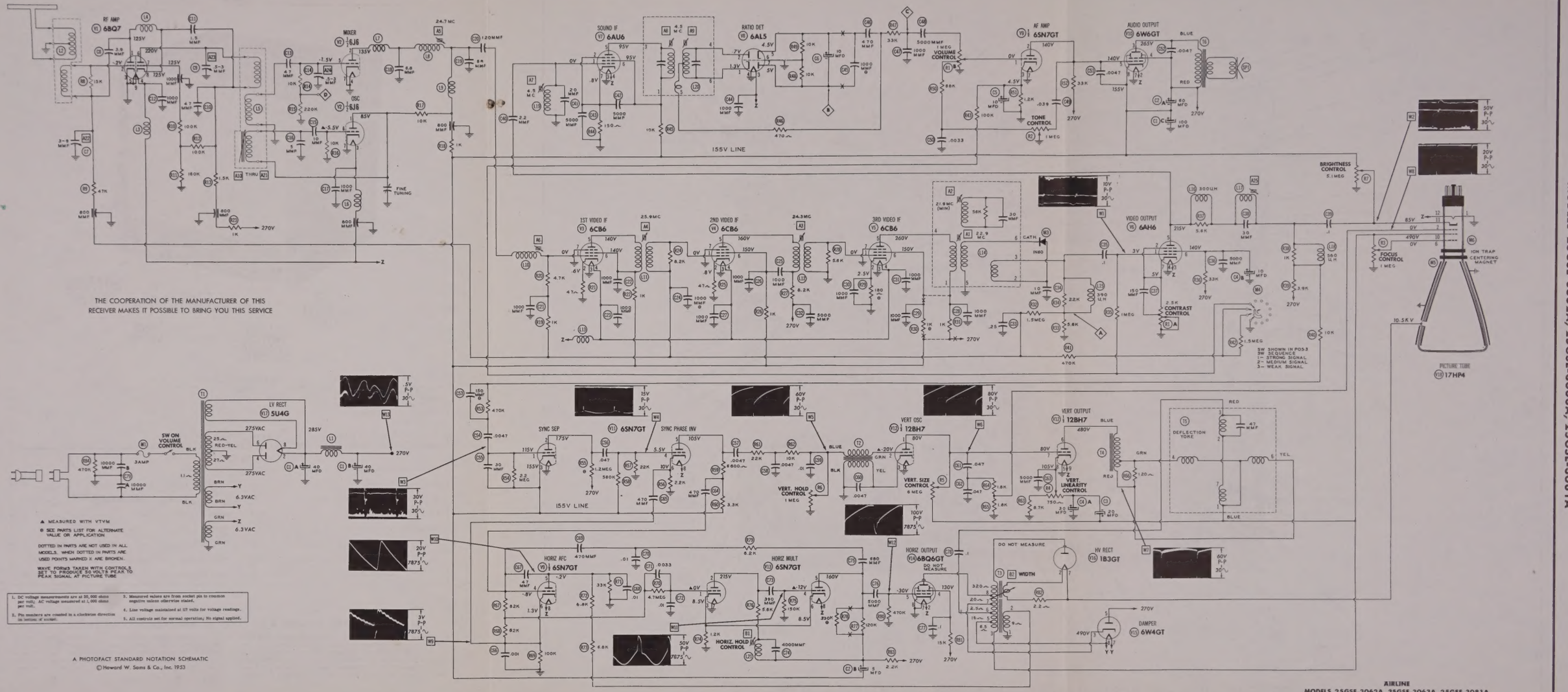
Alignment Instructions 6, 7
Disassembly Instructions 11
Horizontal Sweep Circuit Adjustments 11
Parts List and Discriptions..... 12, 13, 14
Photographs
Cabinet-Rear View 11
Capacitor and Alignment Identification... 4, 9
Chassis - Top View 3
Photos (cont)
RF Tuner 10
Resistor and Induction Identification 15, 16
Resistance Measurements 8
Schematic 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

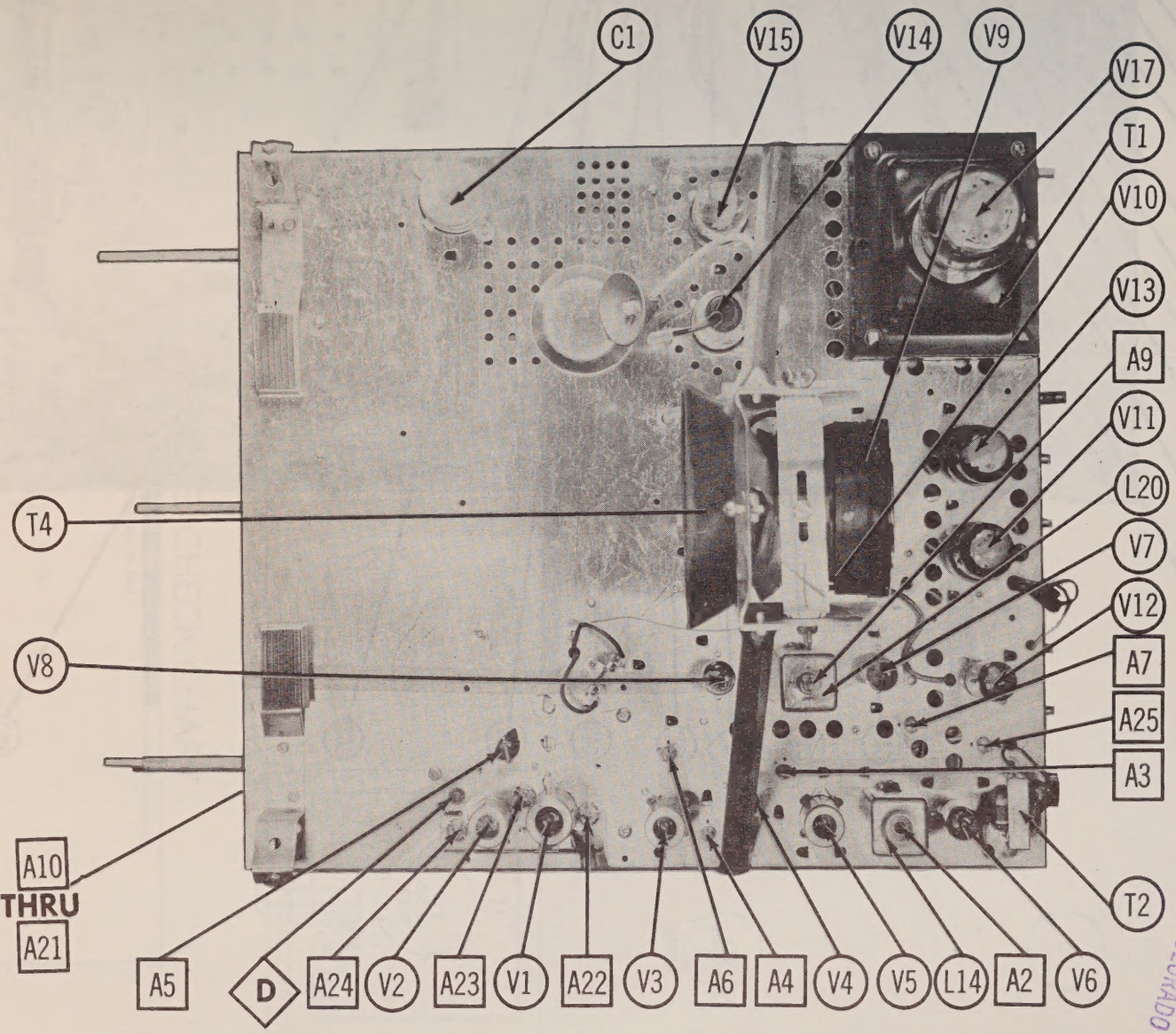
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2-53 SET 195 FOLDER 2

AIRLINE MODELS 25GSE-3062A, 25GSE-3063A, 25GSE-3081A


RF AMP V1 6BQ7
MIXER V2 6J6
OSC V2 6J6
SOUND IF V7 6AU6
RATIO DET V8 6AL5
AF AMP V9 6SN7GT
AUDIO OUTPUT V10 6W6GT
VOLUME CONTROL
TONE CONTROL
155V LINE
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
VIDEO OUTPUT V6 6AH6
BRIGHTNESS CONTROL
CONTRAST CONTROL
FOCUS CONTROL
ION TRAP CENTERING MAGNET
PICTURE TUBE V19 17HP4
SW ON VOLUME CONTROL
LV RECT V17 5U4G
SYNC SEP V11 6SN7GT
SYNC PHASE INV
VERT OSC V12 12BH7
VERT. SIZE CONTROL
VERT. HOLD CONTROL
VERT OUTPUT V12 12BH7
VERT. LINEARITY CONTROL
DEFLECTION YOKE
HORIZ AFC V9 6SN7GT
HORIZ MULT V13 6SN7GT
HORIZ OUTPUT V14 6BQ6GT
DO NOT MEASURE
WIDTH
HV RECT V16 1B3GT
DAMPER V13 6W4GT
HORIZ. HOLD CONTROL
SW SHOWN IN POS 3
SW SEQUENCE
1- STRONG SIGNAL
2- MEDIUM SIGNAL
3- WEAK SIGNAL
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
▲ MEASURED WITH VTVM
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953
AIRLINE
MODELS 25GSE-3062A, 25GSE-3063A, 25GSE-3081A

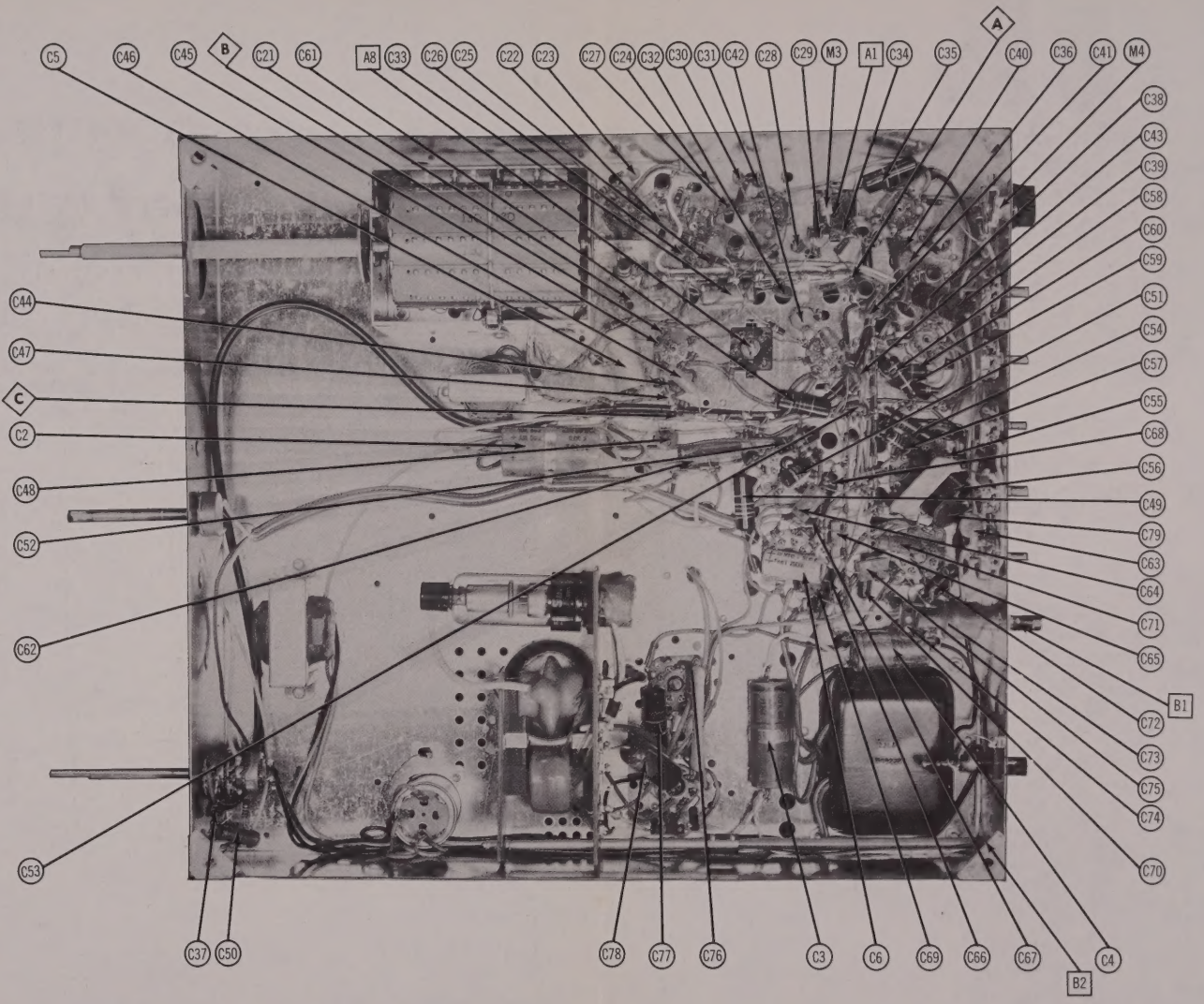
AIRLINE
MODELS 25GSE-3062A, 25GSE-3063A, 25GSE-3081A



CHASSIS TOP VIEW

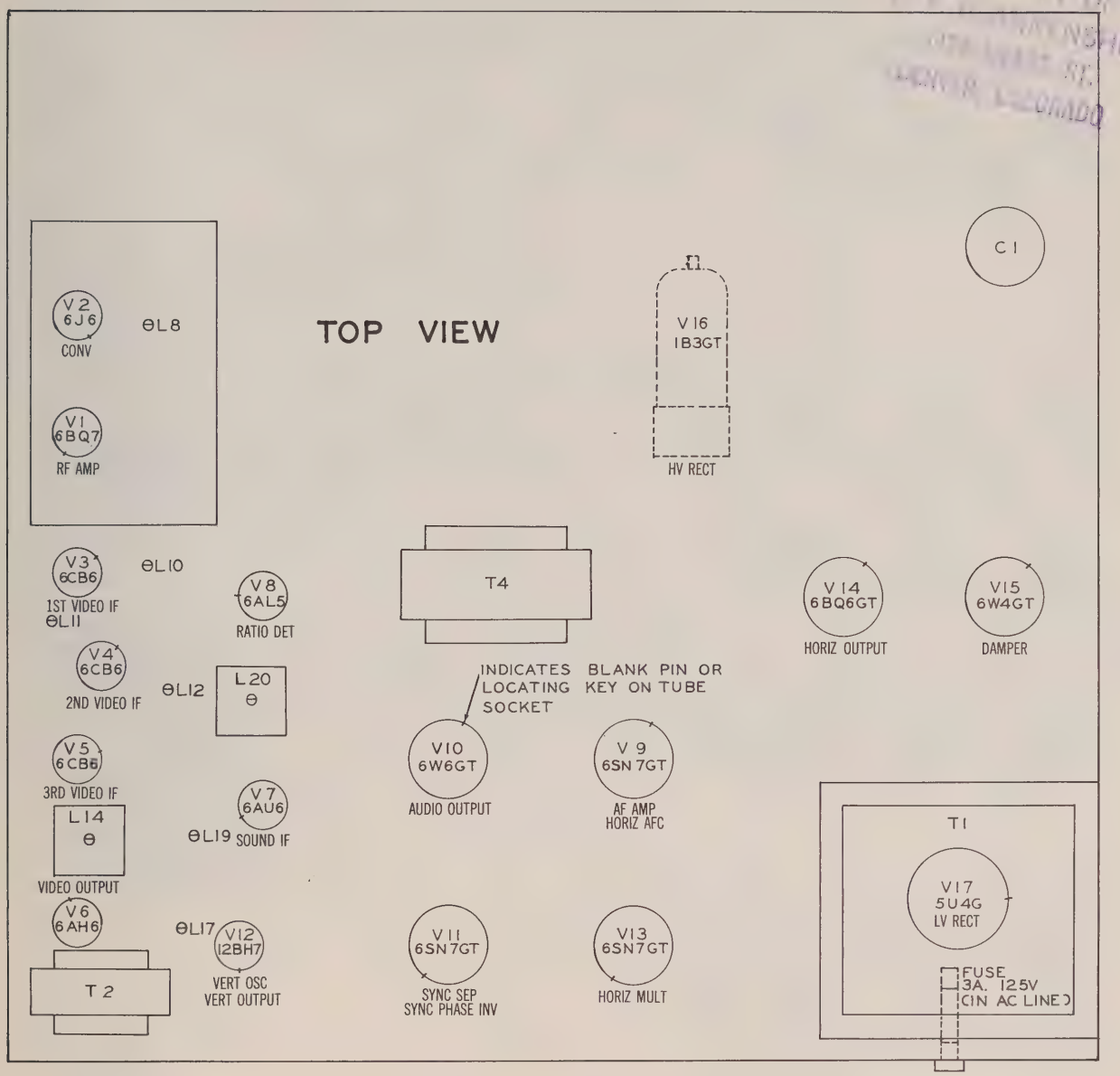
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V17 Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V10
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V6, V18
Has pic, no sound-V 7, V8, V9, V10

SYNC FAILURE
No vert. sync. -V11, V12
No horiz. sync. -V9, V11, V13
No vert. or horiz. sync. -V11

SWEEP FAILURE
No raster, has sound-V13, V14, V15, V16, V18
No vertical deflection-V12
Poor vert. linearity or foldover-V12
Poor horiz. linearity or foldover-V13, V14, V15
Narrow picture-V13, V14, V15, V16, V17
Vert. off freq. - V11, V12
Horiz. off freq. -V9, V11, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt bias battery to ungrounded side of C33. Connect the positive lead to chassis.
Set locality switch to "strong signal" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	22.9MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	21.9MC	"	"	A2	Adjust for MINIMUM deflection.
3.	"	"	24.3MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	25.9MC	"	"	A4	"
5.	"	"	24.7MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an grounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.9MC 23.MC 26.4MC	Any	Vert. amp to point (A). Low side to chassis.	A6	Adjust A6 to place 26.4MC marker at 60% on response curve. If necessary retouch A1, A3, A4, A5 for response similar to fig. 1.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	..001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A7, A8	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C). Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp to point (B). Low side to chassis.	A7, A8	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as in fig. 2.
8.	"	"	"	"	"	Vert. amp to point (C). Low side to chassis.	A9	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in fig. 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screws are accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. to point A Low side to chassis.	A10	Adjust to place sound marker in trap notch as in fig. 4. Video marker should be at 60%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A11	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A12	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A13	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A14	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A15	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A16	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A17	
			79MC (10MC Swp)	77.75MC 81.75MC	5		A18	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A19	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A20	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A21	

ALIGNMENT INSTRUCTIONS (CONT.)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp thru 10KΩ to point (D). Low side to chassis.	A22, A23, A24	Adjust for response similar to fig. 5.
11.	"	"	213 MC (10MC Swp)	211.25MC 215.75 MC	13	"		Check for response similar to fig.5. If markers fall below 70% on any channel make slight compromise adjustments of A22, A23 and A24 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175 .25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63 MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

4.5MC TRAP ALIGNMENT

Turn set on and tune in a TV test pattern.
Adjust A25 for maximum vertical wedge definition.

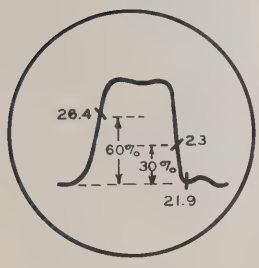


FIG.1

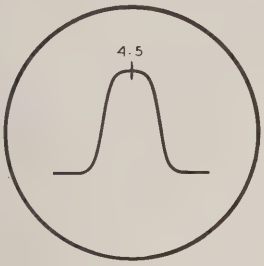


FIG.2

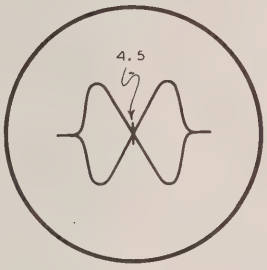


FIG.3

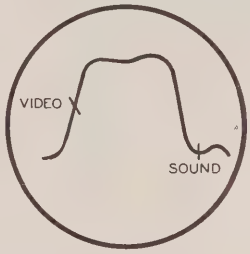


FIG.4

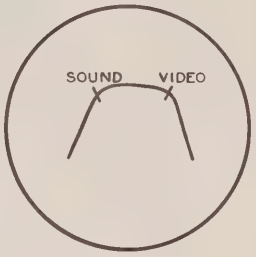


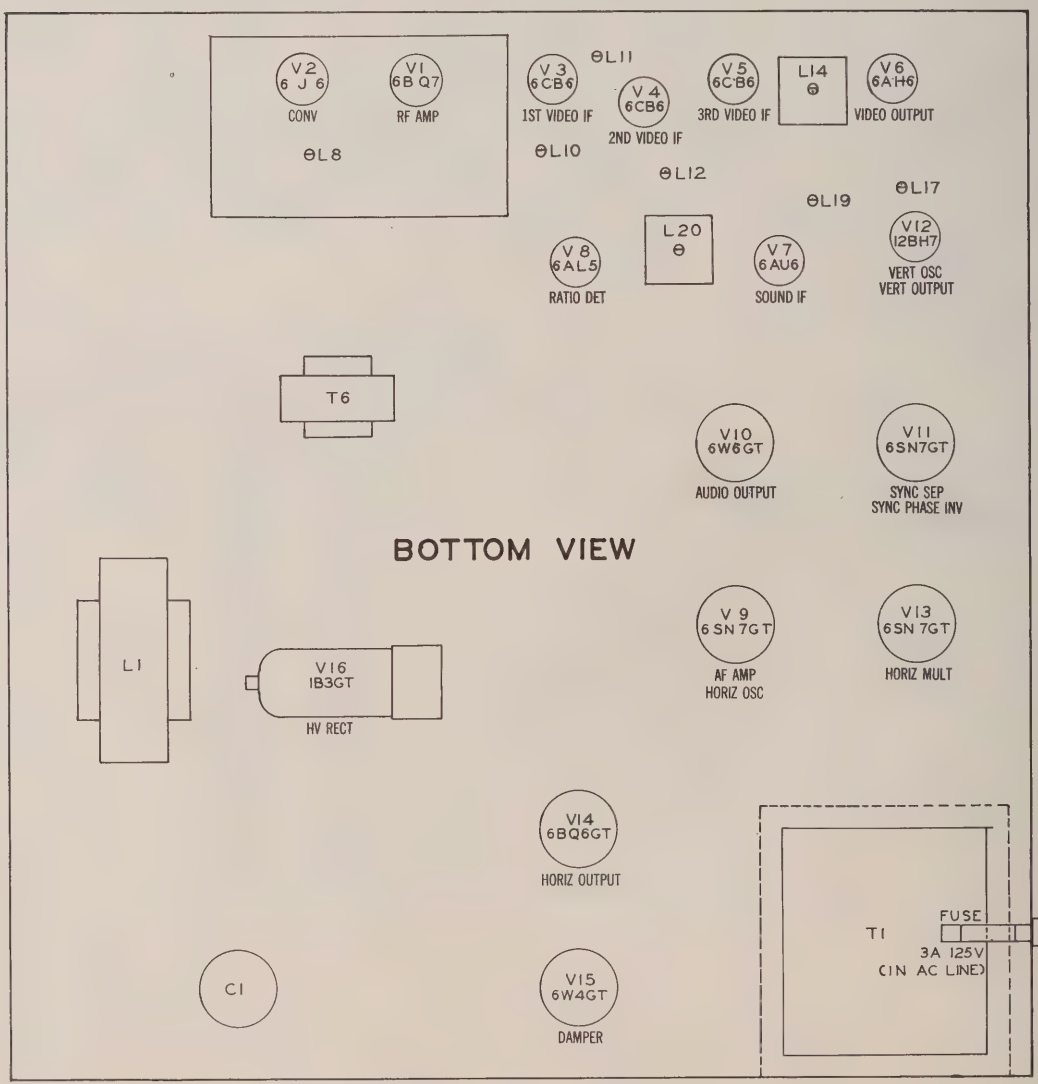
FIG.5

RESISTANCE MEASUREMENTS

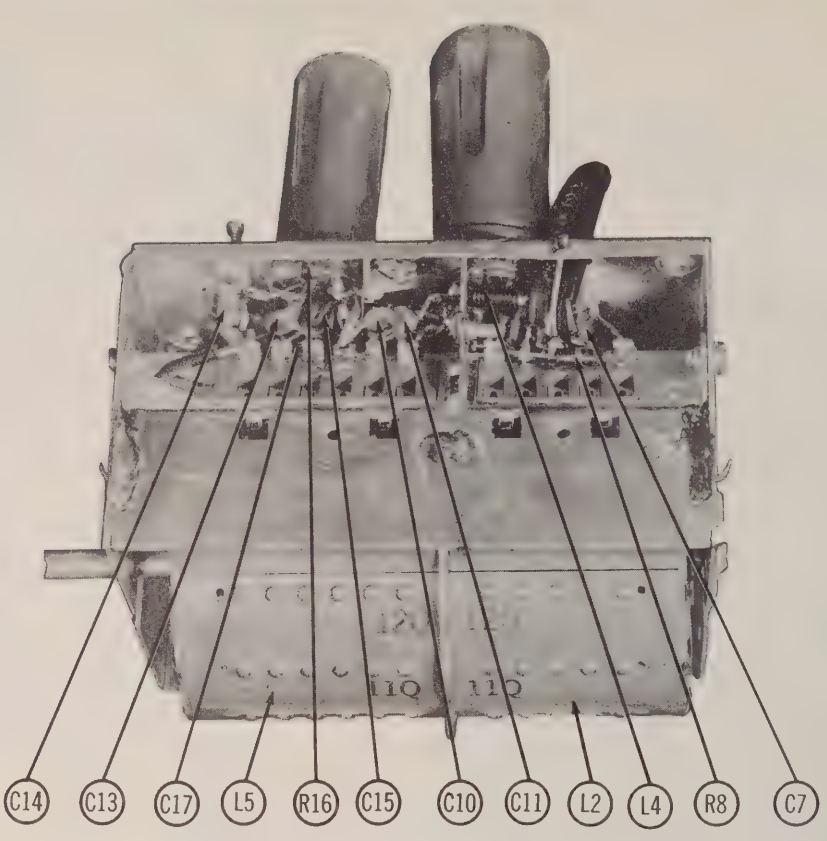
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	1.6Meg	0Ω	.1Ω	0Ω	#2.5KΩ	#180KΩ	INF	0Ω
V 2	6J6	† 11KΩ	† 1KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	1.5Meg	47Ω	0Ω	.1Ω	† 1KΩ	† 1KΩ	0Ω		
V 4	6CB6	1.5Meg	47Ω	0Ω	.1Ω	#8.2KΩ	† 1KΩ	0Ω		
V 5	6CB6	0Ω	180Ω	0Ω	.1Ω	#1KΩ	† 1KΩ	0Ω		
V 6	6AH6	1.1Meg	190Ω	.1Ω	0Ω	#4KΩ	#33KΩ	190Ω		
V 7	6AU6	0Ω	150Ω	0Ω	.1Ω	† 10KΩ	† 10KΩ	150Ω		
V 8	6AL5	INF	INF	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 9	6SN7GT	200KΩ	#33KΩ	1.2KΩ	265KΩ	9.6KΩ	100KΩ	0Ω	.1Ω	
V 10	6W6GT	200Ω	.1Ω	#266Ω	#66.4Ω	#33KΩ	INF	0Ω	125KΩ	
V 11	6SN7GT	† 2.2Meg	#1.2Meg	† 0Ω	22KΩ	† 10KΩ	2.2KΩ	0Ω	.1Ω	
V 12	12BH7	▪3.6Meg	500KΩ	50Ω	0Ω	0Ω	▪825Ω	▪3.6Meg	8.6KΩ	.1Ω
V 13	6SN7GT	4.9Meg	#7.9KΩ	1.2KΩ	150KΩ	#88KΩ	1.2KΩ	0Ω	.1Ω	
V 14	6BQ6GT	INF	.1Ω	INF	#15KΩ	470KΩ	#88KΩ	0Ω	0Ω	Top Cap ▪20Ω
V 15	6W4GT	INF	▪65Ω	800KΩ	INF	#66.4Ω	9.4KΩ	▪18.5Ω	▪18.5Ω	
V 16	1B3GT	PINS 1 TO 8 HAVE INF RESISTANCE								Top Cap ▪340Ω
V 17	5U4G	INF	200KΩ	INF	27Ω	INF	25Ω	INF	200KΩ	
V 18	17HP4	0Ω	1.8KΩ	Pin 6 30Ω	Pin 10 ▪25Ω	Pin 11 640KΩ	Pin 12 .1Ω			

LOCALITY SWITCH IN WEAK SIGNAL POSITION.

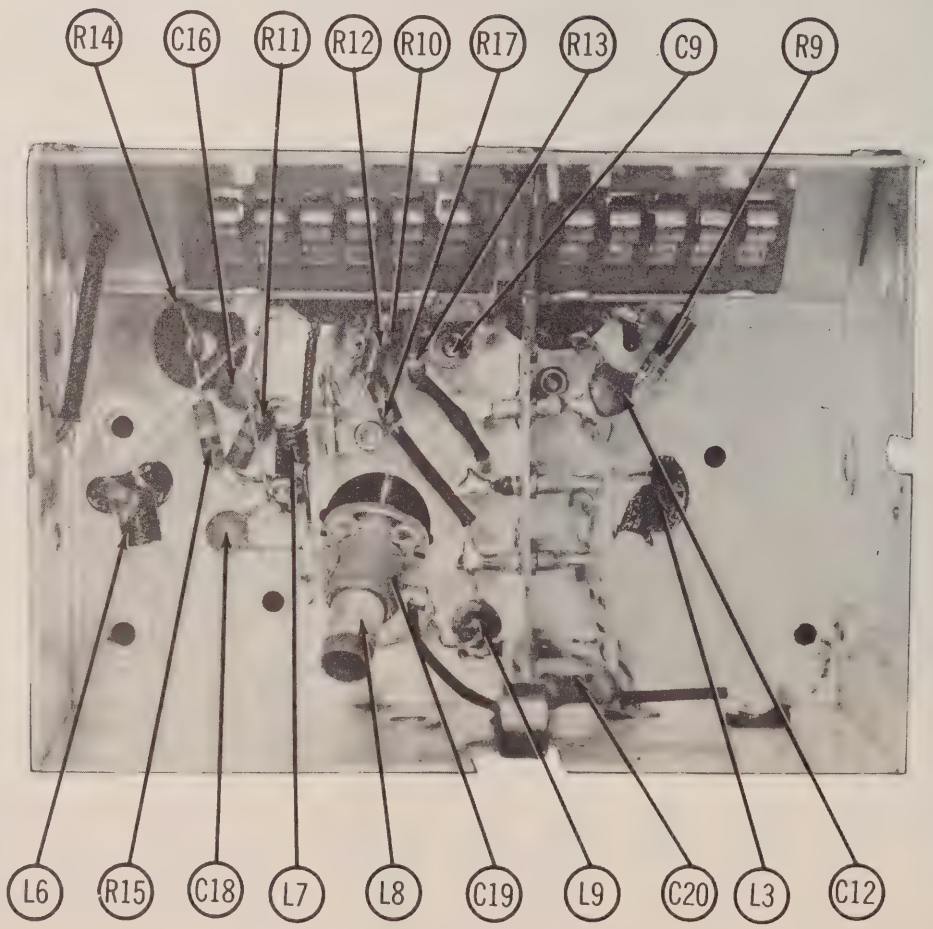
† MEASURED FROM 155V LINE
# MEASURED FROM PIN 2 OF V17
▪ MEASURED FROM PIN 3 OF V15



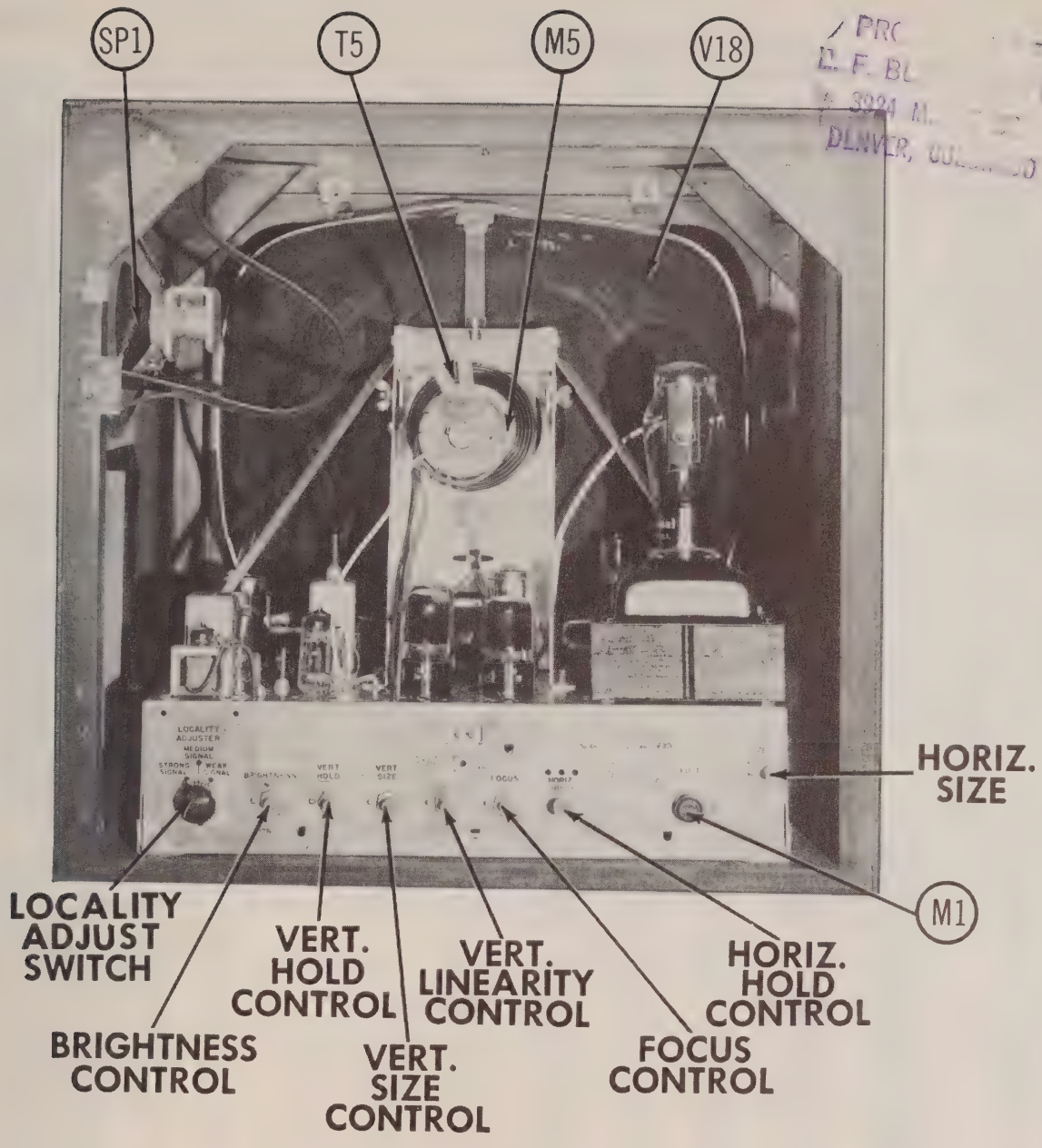
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET–REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and turn in a TV station, preferably a test pattern. Adjust the horizontal hold (B1) until the picture synchronizes horizontally. Adjust the width control (B2) for a picture slightly wider than necessary to fill the mask horizontally.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push on type control knobs from front panel.
2. Remove 11 wood screws. Remove rear cover.
3. Disconnect built-in antenna. Loosen 2 wood screws. Remove antenna bracket.
4. Disconnect speaker plugs from chassis. Remove 4 speaker nuts. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J8	6J8	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6AB8	6AB8	7BK	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier-Horiz. AFC	6SN7GT	6SN7GT	8BD	
V10	Audio Output	6W6GT	6W6GT	7S	
V11	Sync Separator Sync Phase Inv.	6SN7GT	6SN7GT	8BD	
V12	Vert. Oscillator-Vert. Output	12BH7	12BH7	9A	
V13	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V14	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V15	Damper	6W4GT	6W4GT	4CG	
V16	HV Rectifier	1B3GT	1B3GT	3C	
V17	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V18	17HP4	17HP4 17RP4	12C 12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	≤40	350	25E65	AFH3-150		UPT4450-1020		FP375	TVL-3764	
B	≤40	350								
C	≤100	200								
C2A	60	200	25E62	PRS200/30-30		UP6025		TC68		Red
B	5	200		PRS250/4				TC50X		Plain
C3	30	450	25E64	PRH450/30		BR3045A		TC70	TVA-1709	Red
C4A	30	200	25E63	PRS450/30		UPT3145		TC62		Red
B	10	350		PRS450/10				TC58		Plain
C5	10	50	25E66	PRH50/10		BR105		TC32	TVA-1304	
C6	10	50	25E67	PRH50/10		BR105		TC32	TVA-1304	
C7	3-9		31A-079		829-10					
C8	3.9		CDSC020C							
C9	.5-3		31A-069		829-3		CT565A			
C10	47		CD8Q470K	S147	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C11	1.5		CD8CB5M	SU.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C12	1000		CD8Y102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C13	47		CD8Q470K	S147	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C14	.5-3		31A-069		829-3		CT565A		10KD-50	
C15	10		CD10C100K	SH0NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C16	5		CD8U050C		TCN-5		N750K-050	NT-555	5TCUB-V5	
C17	1000		CD8Y102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C18	6.8		CD8C6R8C	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V6R8	
C19	68	500	13B-052	1469-00007		5R5Q7			M5-47	
C20	120		13D-055	SI120	D6-121	BR3DT12	GP2K-121	UC-5312	5GA-T12	
C21	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C22	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C24	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C25	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C26	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C27	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C28	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C29	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 1
C30	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C32	5000		23E2025	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	.25	100	23E122	P488-25		PTE4P25		PT4025	2TM-P25	
C34	10		23E25	SI0NT50	TCN-10		N750K-100	NT-541	5TCU-Q1	
C35	1.1	200	23E3216	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C36	5000		23E2025	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C37	150		23E2027-10	SI150	D6-151	5WST15	GP2K-151	UC-5315	5GA-T15	
C38	30		23E33		TCZ-30		N P0K-300	PT401	4TM-P1	
C39	.1	400	23E3416	P488-1	DF-104	PTE4P1			5TCCB-V22	
C40	2.2		23E21		TCZ-2.2		N P0K-2R2 N150K-200			
C41	20		23E22							
C42	5000		23E2025	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C43	5000		23E2025	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C44	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 1
C45	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C46	470	500	23E3500-40	1469-0005		5R575		MC8245	M5-35	
C47	1000		23E2027-9	SI000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C48	5000		23E2025	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C49	.039	400	23E3423	P686-04		PTE6S4		PT6S4	6TM-S4	
C50	.0033	400	23E3407	P686-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D33	
C51	.0047	400	23E3408	P686-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C52	.0047	600	23E3608	P686-0047	D6-472	PTX6D47	GP2-333-472	PT6247	6TM-D47	
C53	150			SI150	D6-151	5WST15	GP2K-151	UC-5315	5GA-T15	Note 2
C54	.0047	600	23E3608	P686-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C55	30		23E23				NP0L-330			
C56	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C57	.0047	400	23E3408	P686-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C58	.0047	400	23E3408	P686-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C59	.01	400	23E3424							
C60	.0047	400	23E3408	P686-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C61	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C62	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C63	5000		23E2025	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C64	470	500	23E3500-40	1466-0005	D6-471	5W5T5	GP2K-471	MC245	1FM-35	
C65	470	500	23E3500-40	1466-0005	D6-471	5W5T5	GP2K-471	MC245	1FM-35	
C66	.001	400	23E3404	P686-001	D6-102	PTE6D1	GP2L-102	PT6D1	6TM-D1	
C67	47		23E2030-15	SI47NT50	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C68	.01	400	23E3410	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C69	470	500	23E3500-40	1466-0005	D6-471	5W5T5	GP2K-471	MC245	1FM-35	
C70	.01	400	23E3410	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C71	.0033	400	23E3407	P686-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D33	
C72	.01	400	23E3410	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C73	390	500	23E3500-39	1469-0004		5R5T4		MCB243	M5-34	
C74	4000	500	23E2033-4	1464-004		1DR5D4		MC B463	MS-24	
C75	680	500	23E3500-86	1469-0007		2R5T7			M5-37	
C76	5000		23E2025	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C77	.1	400	23E3416	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C78	.1	600	23E3618	P686-1	DF-104	PTE6P1		PT601	6TM-P1	
C79A	10000	1000	23E2037-6							
B	10000	1000								

Note 1. Not used in all Models.
Note 2. Some Models use 220MMF in this application (Part #23E2027-6)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2500Ω		28E84	QU-383 *		SBBT-725-B		Contrast-Tapped @ 2000Ω-Panel
B	1Meg							Volume & Sw. tapped @ 225KΩ-Rear
R2A	1Meg		28E85	QU-137	AG-61-8	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A.
R3A	1Meg		28E89	QU-137	AG-61-8	AB-69	SU-54	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A.
R4A	750Ω		28E86	QU-105	AG-8-8	AB-5	U-4	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	5Meg		28E88	QU-141	AG-65-8	AB-87	SU-87	Vert. Size-See Note 1.
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	1Meg		28E90	QU-133	AG-61-8	AB-69	SU-54	Vert. Hold-See Note 2.
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A.
R7A	5.1Meg		28E87	QU-141	AG-65-8	AB-87	SU-87	Brightness-See Note 3.
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A

Note 1. Add a 1MegΩ resistor in series with clockwise terminal and positive side of C3.
Note 2. Add a 330KΩ resistor in series with clockwise terminal and ground.
Note 3. Add a 100KΩ resistor in series with clockwise terminal and ground.
* CONCENTRIKIT EQUIVALENT - KIT K-2 BASE ELEMENTS & SHAFTS B27-11IX & P6-7I8 (Panel)
B18-137X & R9-314 (Rear) & SWITCH T6-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	AIRLINE PART No.	IRC PART No.	NOTES
R8	15KΩ	½	27E153-2	BTS-15K	
R9	47KΩ	½	37E473-2	BTS-47K	
R10	100KΩ	½	27E1009-27	BTS-100K	
R11	160KΩ-5%	½	27E1009-12		
R12	100KΩ-5%	½	27E1009-27		
R13	150Ω	½	27E152-2	BTS-150Ω	
R14	10KΩ	½	27E103-2	BTS-10K	
R15	220KΩ	½	27E224-2		
R16	10KΩ	½	27E103-2	BTS-10K	
R17	10KΩ	½	27E103-2	BTS-10K	
R18	1000Ω	½	27E102-2	BTS-1000	
R19	1000Ω	½	27E102-2	BTS-1000	
R20	4700Ω	½	27E1009-28	BTS-4700	
R21	47Ω	½	27E470-2		
R22	1000Ω	½	27E102-2	BTS-1000	
R23	1000Ω	½	27E102-2	BTS-1000	
R24	82000Ω	½	27E1009-32	BTS-8200	
R25	47Ω	½	27E470-2		
R26	1000Ω	½	27E102-2	BTS-1000	
R27	8200Ω	1	37E822-3	BTA-8200	
R28	5600Ω-5%	½	27E1009-8		
R29	180Ω	½	27E181-2	BTS-180	Note 2
R30	1000Ω	½	27E102-2	BTS-1000	Note 1
R31	1000Ω	½	27E102-2	BTS-1000	
R32	1.5Meg	½	27E155-2	BTS-1.5Meg	
R33	5600Ω-5%	½	27E1009-8	BTS-5600-5%	
R34	22KΩ	½	27E223-2	BTS-22K	
R35	1 Meg	½	27E105-2	BTS-1 Meg	
R36	33KΩ	1	37E333-3	BTA-33K	
R37	5600Ω	½	27E1009-8	BTS-5600	
R38	1000Ω	½	27E102-2	BTS-1000	
R39	39000Ω-5%	½	27E1009-48	BTS-3900-5%	
R40	10KΩ	½	27E103-2	BTS-10K	
R41	470KΩ	½	27E474-2	BTS-470K	
R42	1.5Meg	½	27E155-2	BTS-1.5Meg	
R43	100KΩ-5%	½	27E1009-10	BTS-100K-5%	
R44	150Ω	½	27E151-2	BTS-150	
R45	10KΩ	½	27E103-2	BTS-10K	
R46	470Ω	½	27E471-2	BTS-470	
R47	33KΩ	½	27E333-2	BTS-33K	
R48	10KΩ-5%	½	27E103-2	BTS-10K-5%	
R49	10KΩ-5%	½	27E103-2	BTS-10K-5%	
R50	68KΩ	½	27E683-2	BTS-68K	
R51	1200Ω	½	27E122-2	BTS-1200	
R52	33KΩ	½	27E333-2	BTA-33K	
R53	470KΩ	½	27E474-2	BTS-470K	
R54	2.2Meg	½	27E225-2	BTS-2.2Meg	
R55	1.2Meg	½	27E105-2	BTS-1.2Meg	Note 3
R56	2200Ω	½	27E222-2	BTS-2200	
R57	22KΩ	½	27E223-2	BTS-22K	
R58	560KΩ	½	27E564-2	BTS-560K	
R59	6800Ω-5%	½	27E682-2	BTS-6800-5%	
R60	3300Ω	½	27E332-2	BTS-3300	
R61	22KΩ	½	27E223-2	BTS-22K	
R62	10KΩ	½	27E103-2	BTS-10K	
R63	9100Ω	½	27E912-2	BTS-9000	
R64	1800Ω	½	27E182-2	BTS-1800	
R65	1800Ω	½	27E182 2	BTS-1800	
R66	120Ω	½	27E121-2	BTS-120	
R67	82KΩ	½	27E823-2	BTS 82K	
R68	82KΩ	½	27E823-2	BTS-82K	
R69	100KΩ	½	27E1009-10	BTS-100K	
R70	4.7Meg	½	27E475-2	BTS-4 7Meg	
R71	33KΩ	½	27E333-2	BTS 33K	
R72	6800Ω-5%	½	27E682-3	BTA-6800-5%	
R73	6800Ω-5%	1	27E682-3	BTA-6800-5%	
R74	1200Ω	½	27E122-2	BTS-1200	
R75	150KΩ	½	27E154-2	BTS-150K	
R76	5600Ω	½	27E1009-8	BTS-5600	
R77	120KΩ	½	27E1009-47	BTS-120K	
R78	330KΩ	½		BTS-330K	
R79	8200Ω-5%	½	27E1009-22	BTS-8200-5%	
R80	470KΩ	½	27E474-2	BTS-470K	
R81	15KΩ	1	27E1015-13	1 3/4A-15K	
R82	2.2Ω		27E1015-2		
R83	2200Ω	½	27E222-2	BTS-2200	
R84	470KΩ	½	27E474-2	BTS-470K	

Note 1. Not used in all models.
Note 2. Some models use a 82Ω resistor in this application.
Note 3. Some models use a 1 Meg resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC & 1.54A	550VCT & .200ADC	5VAC & 3A	6.3VAC & 2A SEC. 1 6.3VAC & 6.2A	22E74				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	500	20Ω	22E70	A-8125	A-3000 ①	TBO-1	A-97X	Vert. Osc. Trans. Horiz. Output Trans.
T3	365Ω tap @ 6.5Ω, 22.5Ω, 250, 450	9Ω SEC. 2 0Ω	22E75					
T4	800Ω tap @ 11Ω		22E72	A-8140 ②③	A-3081 ①	TSO-62 ④	A-103X ⑤	Vert. Output Trans.
T5A	40Ω		20E788-2	DY-10 ⑤	MDF-30 ⑤	TY-4 ⑤	Y-30 ⑤	Horiz. Deflection Coils
B	3.3Ω		20E788 ④					Vert. Deflection Coils

① Drill one new mounting hole.
② Drill new mounting holes.
③ Connect as Auto Transformer.
④ Alternate Deflection Yoke
⑤ Use original deflection network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI	RATING: DC RES. SEC	AIRLINE PART No.	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	NOTES
T6	2.15KΩ	2.6Ω	290Ω	.6Ω	22E71	A-3876	A-2928	RO-2	S-2X	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP	AIRLINE PART No	JENSEN PART No	QUAM PART No	NOTES
SP1	8"	PM	2.6Ω	1E49 1E49-2 ① 1E45 ② 1E43-2 ③ 1E43-3 ④	ST-108 Mod. P6-X	8A1	① Alternate 8" PM Speaker ② 8" PM Speakers used in Models 456 & 457

FILTER CHOKE

ITEM No	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D C. RESISTANCE	RATINGS: INDUCTANCE (@ CURRENT (1000 ^c/s))	AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No	TRIAD PART No
L1	.200A	66 4Ω	1.8 Hy.	22E73	C-2325 ↓	C-2996 ↓	TH-1733 ↓	C-21X ↓

↓ Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	AIRLINE PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	Ant. Coil	0Ω	0Ω	31F-522			Channel 2
L3	Fil. Choke	0Ω		34A-546			
L4	Feedback Coil	0Ω		31B-296			
L5	RF, Mixer Grid & Osc. Coil	0Ω		31F-822			Channel 2
L6	Fil. Choke	0Ω		34A-575			
L7	RF Choke	0Ω		31B-838			
L8	Conv. Plate	.7Ω		31A-095	TV-102 *		
L9	RF Choke	1.2Ω		31B-230			
L10	1st. Video IF	.2Ω		20E780			
L11	2nd. Video IF	.2Ω	2Ω	20E779			
L12	3rd Video IF	.2Ω	.2Ω	20E781			
L13	Fil. Choke	1.2Ω		26-92			
L14	4th. Video IF	.5Ω	.5Ω	20E782		CLA	1.5 Microhenries Includes trap, also includes series peaking coil. 30MMF capacitor & 56KΩ resistor
L15	Shunt Peaking Coil	15Ω		20E363-19			390 Microhenries
L16	Series Peaking Coil	12Ω		20E363-21	TV-185		300 Microhenries
L17	4.5MC Trap	3Ω		20E785	TV-151		
L18	Shunt Peaking Coil	19Ω		20E363-20	TV-188		560 Microhenries
L19	Sound IF	2Ω		20E785	TV-151		
L20	Ratio Det.	4Ω	.8DCT	20E783	TV-110		Tertiary Winding - .4Ω
L21	Horiz. Osc.	55Ω		20E786	TV-163		

* Enlarge mounting hole.

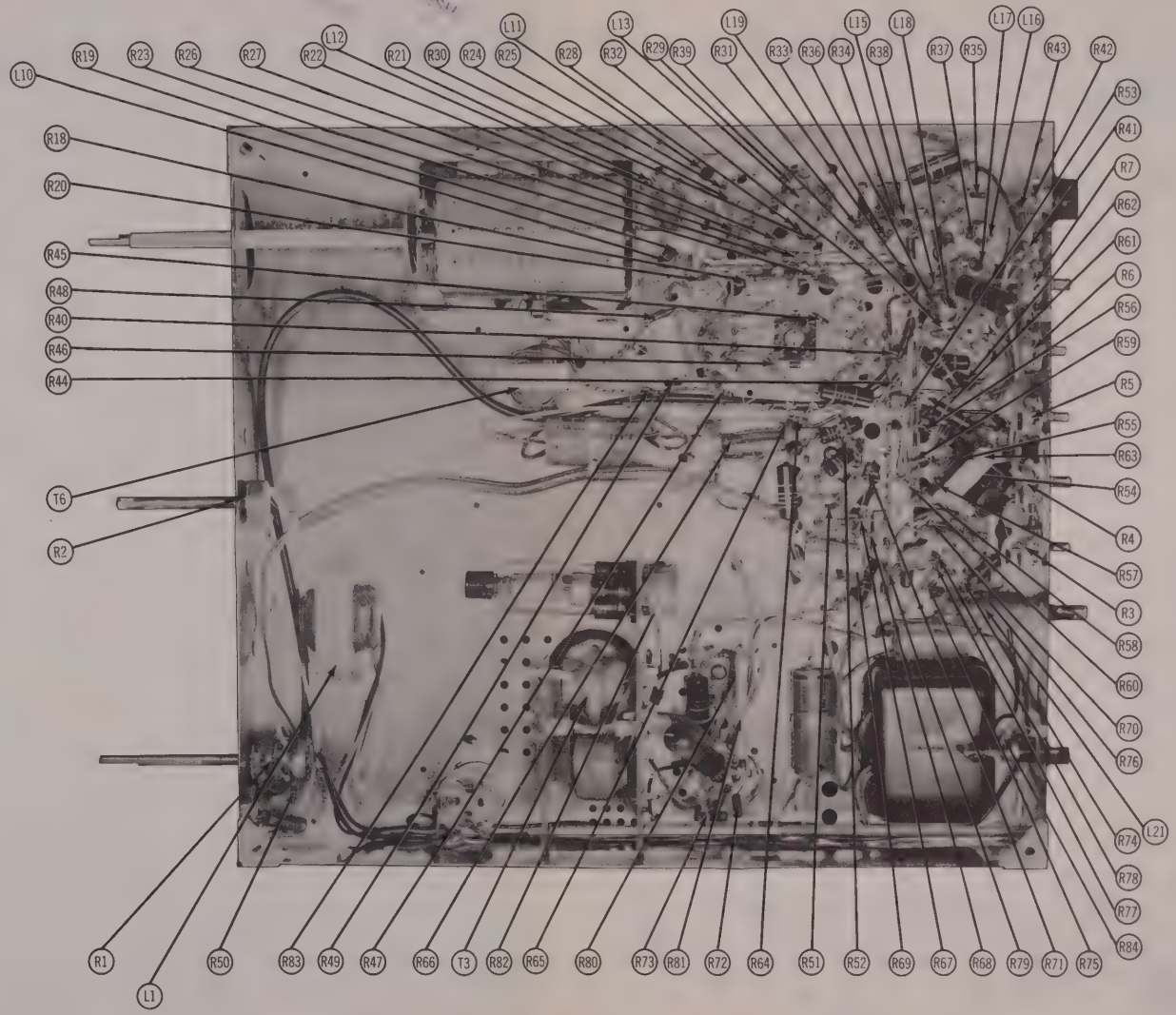
FUSES

ITEM No.	TYPE	RATING	AIRLINE PART No.: FUSE	AIRLINE PART No.: HOLDER	LITTELFUSE PART No.: FUSE	LITTELFUSE PART No.: HOLDER	BUSS PART No.: FUSE	BUSS PART No.: HOLDER
M1	3AG Slo-Blo	3 A 125V.	40E8-10	55E57	313003	342001	MDL-3	HKP

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M2	RF Tuner	20E787	
M3	Crystal Diode	MW1N60	Video Detector (1N60)
M4	Switch	MW29E29	Locality Adjuster
M5	Centering Magnet		Mounted on back cover of yoke
M6	Ion Trap	MW15E174-6	
	Antenna Coil	31F-523	Channel #3
	Antenna Coil	31F-524	Channel #4
	Antenna Coil	31F-525	Channel #5
	Antenna Coil	31F-526	Channel #6
	Antenna Coil	31F-527	Channel #7
	Antenna Coil	31F-528	Channel #8
	Antenna Coil	31F-529	Channel #9
	Antenna Coil	31F-530	Channel #10
	Antenna Coil	31F-531	Channel #11
	Antenna Coil	31F-532	Channel #12
	Antenna Coil	31F-533	Channel #13
	RF, Mixer Grid & Osc. Coil	31F-623	Channel #3
	RF, Mixer Grid & Osc. Coil	31F-624	Channel #4
	RF, Mixer Grid & Osc. Coil	31F-625	Channel #5
	RF, Mixer Grid & Osc, Coil	31F-626	Channel #6
	RF, Mixer Grid & Osc. Coil	31F-627	Channel #7
	RF, Mixer Grid & Osc. Coil	31F-628	Channel #8
	RF, Mixer Grid & Osc. Coil	31F-629	Channel #9
	RF, Mixer Grid & Osc, Coil	31F-630	Channel 1#10
	RF, Mixer Grid & Osc, Coil	31F-631	Channel #11
	RF, Mixer Grid & Osc. Coil	31F- 632	Channel #12
	RF, Mixer Grid & Osc. Coil	31F-633	Channel #13
	Cabinet Back Assy.	MW20E774-2	
	Safety Glass	MW9E45	
	Mask	MW36E83-2	
	Knob	MW37E71-5	Fine Tuning (Gold)
	Knob	MW37E71-6	Contrast (Gold)
	Knob	MW37E72-11	Channel Selector (Gold)
	Knob	MW37E72-12	Off/On Volume (Gold)
	Knob	MW37E79-2	Tone (Gold)
	Knob	MW37E71-7	Fine Tuning (Mahogany)
	Knob	MW37E71-8	Contrast (Mahogany)
	Knob	MW37E72-13	Channel Selector (Mahogany)
	Knob	MW37E72-14	Off/On Volume (Mahogany)
	Knob	MW37E79	Tone (Mahogany)

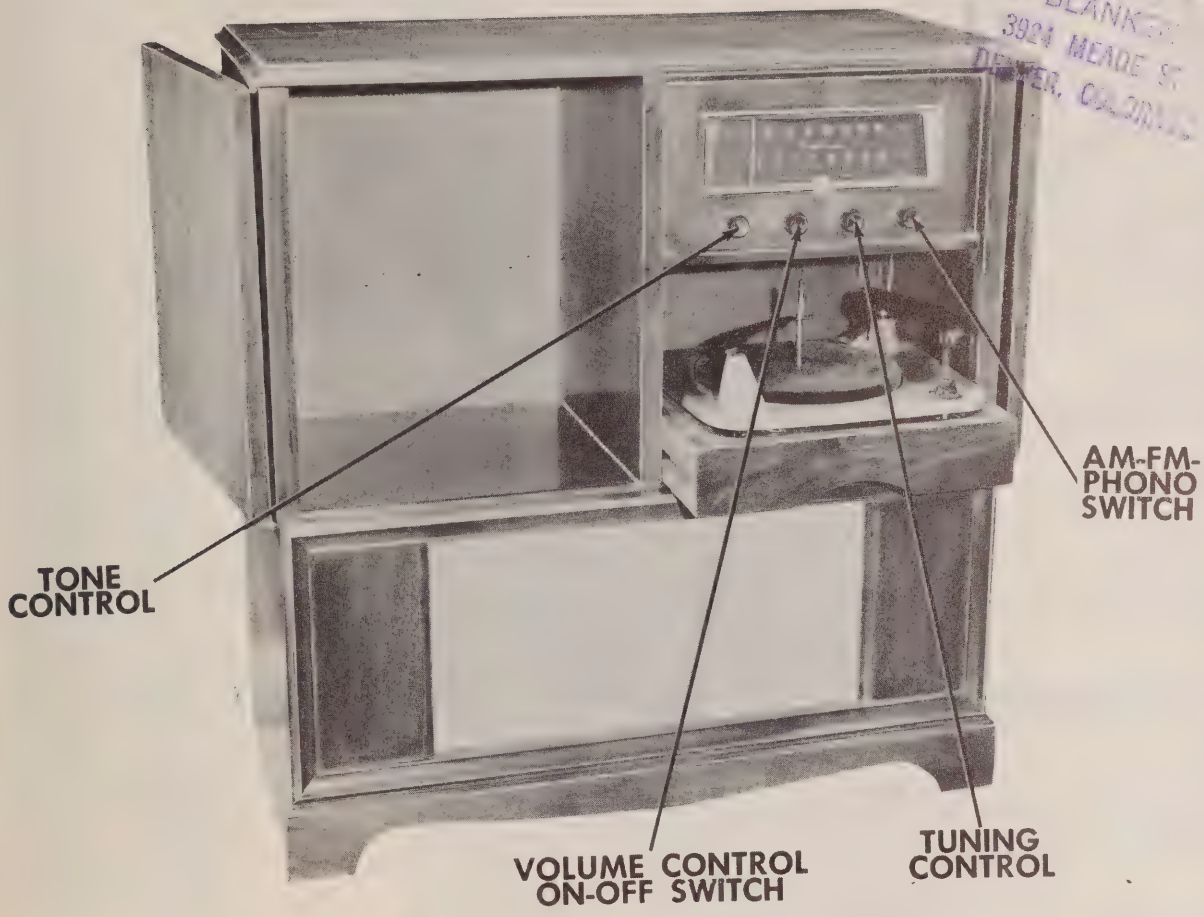


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

AIRLINE
MODELS 25WG-2758C, 25WG-2766A

PROPERTY OF
L. F. BLANKEN
3924 MEADE ST.
DENVER, COLORADO

AIRLINE
MODELS 25WG-2758C, 25WG-2766A



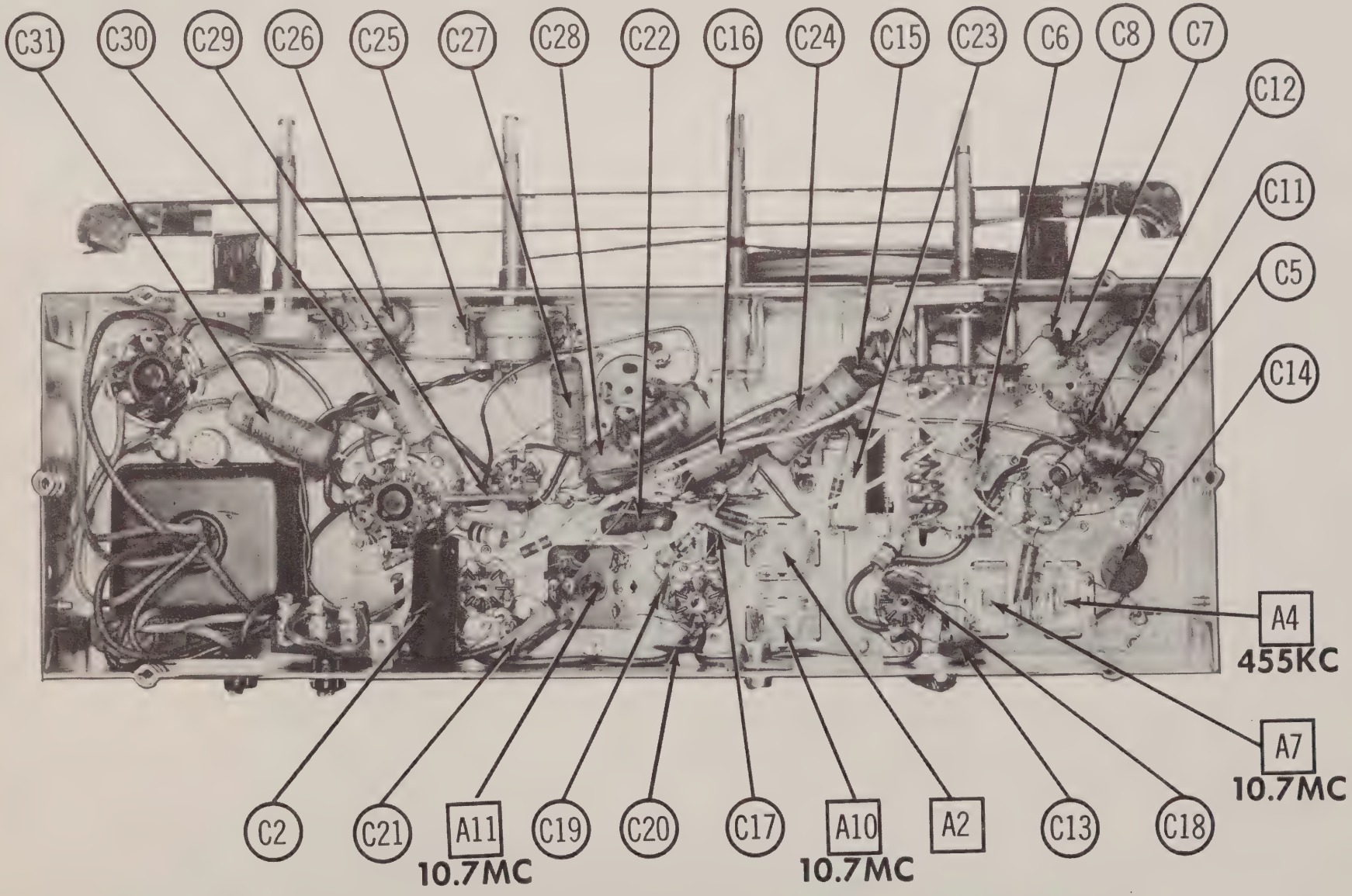
AIRLINE
MODELS 25WG-2758C, 25WG-2766A

TRADE NAME	Airline Models 25WG-2758C, 25WG-2766A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated AM-FM - Phono Combination Superheterodyne Receiver
TUBES (Eight)	Types 12AT7 FM RF Amp.-FM Mixer, 6BE6 FM Osc.-AM Conv., (2) 6BA6 IF Amp., 6AL5 Ratio Det., 6AV6 AM Det.-AVC-AF Amp., 6V6GT Audio Output, 6X5GT Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycle RATING .39 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1600 KC FREQ. MOD. 88-108 MC

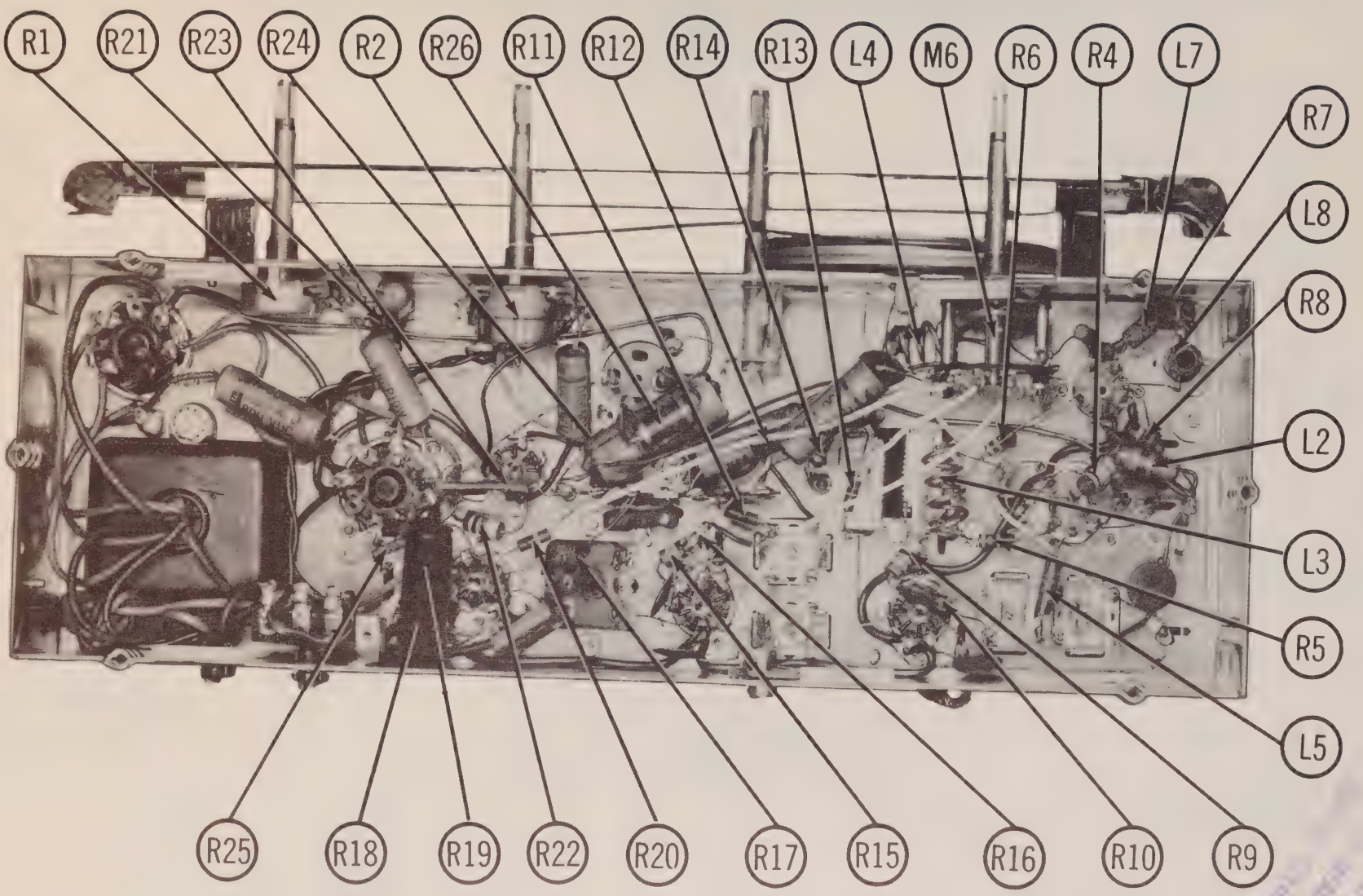
FOR SERVICE INFORMATION ON RECORD CHANGER UNIT- SEE SIMILAR V-M MODEL 950, PHOTOFACT SET #107, FOLDER 13 or RECORD CHANGER MANUAL CM-3.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

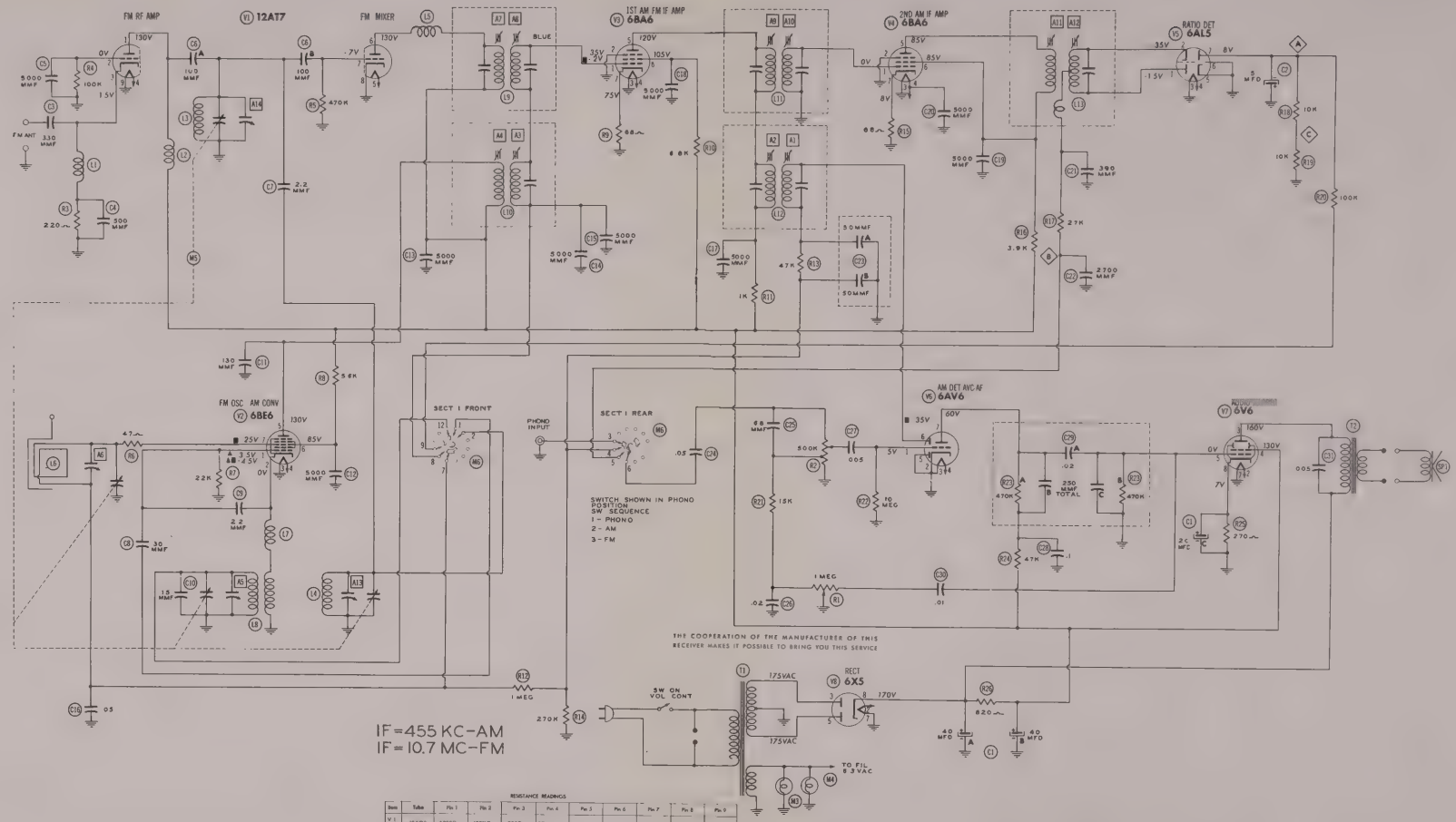
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	†820Ω	100KΩ	230Ω	0Ω	0Ω	†820Ω	470KΩ	0Ω	.1Ω
V 2	6BE6	22KΩ (200Ω)	2Ω	0Ω	.1Ω	†820Ω	15.6KΩ	1.3 Meg		
V 3	6BA6	91.2KΩ	.2Ω	0Ω	.1Ω	11.8KΩ	17.6KΩ	54Ω		
V 4	6BA6	.8Ω	2Ω	0Ω	.1Ω	14.7KΩ	14.7KΩ	68Ω		
V 5	6AL5	INF	INF	0Ω	.1Ω	0Ω	0Ω	90KΩ		
V 6	6AV6	10 Meg	0Ω	0Ω	.1Ω	0Ω	317KΩ	†317KΩ		
V 7	6V6GT	INF	.1Ω	†440Ω	†820Ω	470KΩ	.3Ω	0Ω	370Ω	
V 8	6X5GT	INF	0Ω	1230	INF	1230	INF	1Ω	†30KΩ	

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE SPECIFIED
* MEASURED IN "AM" POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 8 OF V8

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W Sams & Co., Inc. 1953

195-3

ALIGNMENT INSTRUCTIONS

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 1 (grid) of 6BA6 (V3). Low side to chassis.	455 KC (400∿Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output.
2.	"	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	"	"	"	"	A3, A4	"
3.	"	"	1620KC	"	"	"	A5	"
4.	Direct	High side to external antenna terminal. Low side to chassis.	1400KC	"	Tune to 1400 KC signal	"	A6	Adjust for maximum output. Set pointer at 1400KC on dial scale.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to pin 7 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Unmod)	FM	Tuning gang fully open.	DC probe to point Ⓐ Common to chassis.	A7, A8, A9, A10, A11	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point Ⓑ Common to point Ⓒ	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
5.	.001MFD	High side to pin 7 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. to point Ⓐ. Low side to chassis.	A7, A8, A9, A10, A11	Disconnect stabilizer capacitor C2. Adjust for curve of maximum amplitude and symmetry as in Fig. 1.
6.	"	"	"	"	"	Vert. Amp. to point Ⓑ Low side to chassis.	A12	Reconnect capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
7.	270Ω Carbon Resistor	High side thru 270Ω to high FM antenna terminal. Low side to chassis.	108.5MC (Un mod)	FM	Tuning gang fully open.	DC probe to point Ⓐ Common to chassis.	A13	Adjust for maximum deflection.
8.	"	"	104.5MC	"	Tune to 104.5MC signal.	"	A14	"

FIG. 1

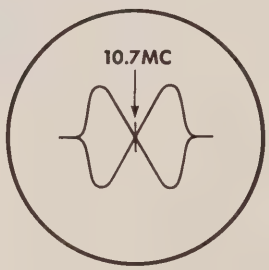


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIR LINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	FM RF Amplifier				
	FM Mixer	12AT7	12AT7	9A	
V2	FM Oscillator				
	AM Converter	6BE6	6BE6	7CH	
V3	1st. FM IF Amp.	6BA6	6BA6	7BK	
V4	2nd. FM IF Amp.	6BA6	6BA6	7BK	
V5	Ratio Detector	6AL5	6AL5	6BT	
V6	AM Detector- AVC				
	AF Amplifier	6AV6	6AV6	7BT	
V7	Audio Output	6V6GT	6V6GT	7S	
V8	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

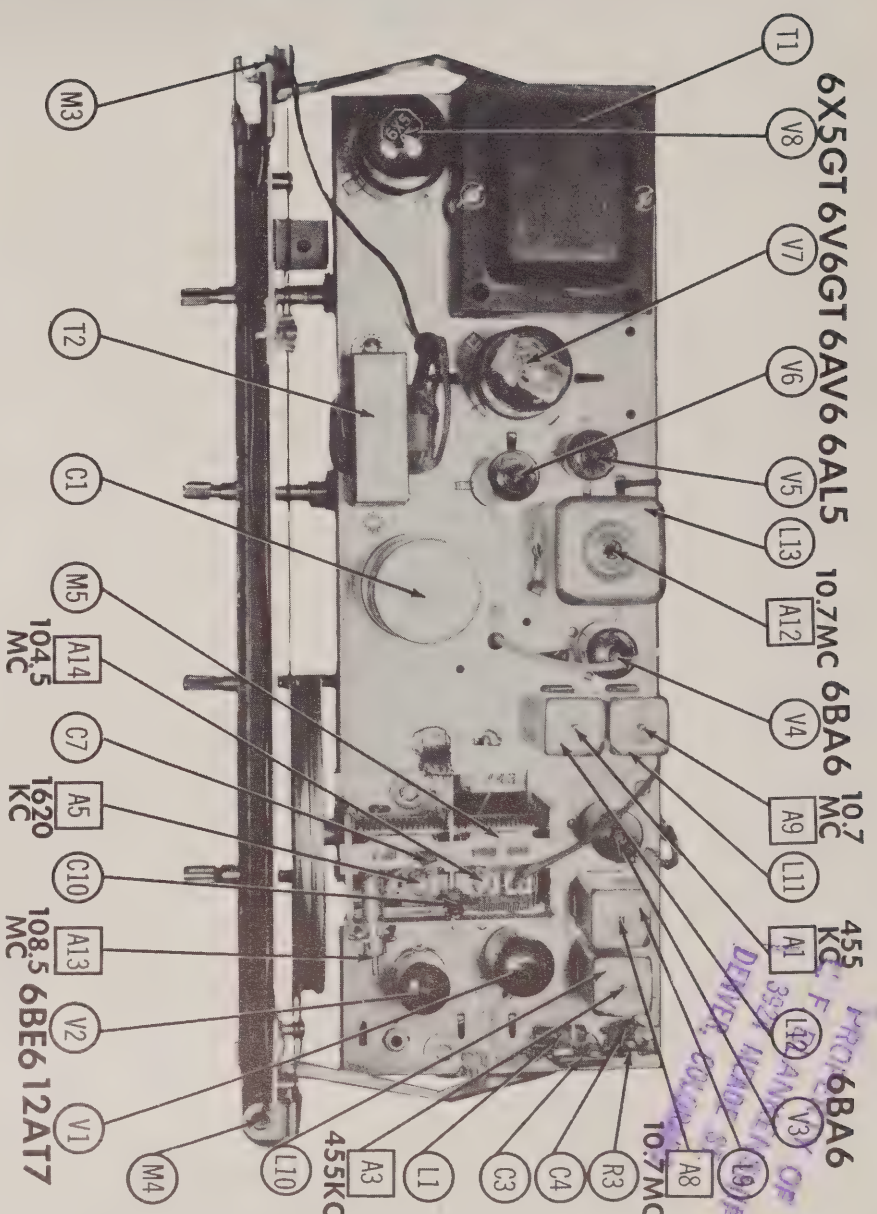
ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIR LINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	200	45X360	AFH3-100		C107		FP346	TVL-4605	
B	■40	150								
C	▲20	25						TC40	TVA-1402	
C2	5	100	45X361	PRS150/4		BR415				
C3	330	500	47X470	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C4	500		47X508	SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C5	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C6A	100		76X4	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
B	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C7	2.2		47X557		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C8	30		47X558		TCN-30		N750K-300			
C9	2.2		47X557		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C10	15		47X552	SI15N750	TCN-15		N750K-150	NT-5415	5TCU-Q15	
C11	130		47X559		TCN-130		N750L-131			
C12	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C13	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C14	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C15	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C16	.05	200	B66503	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C17	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C18	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C19	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C20	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C21	390	500	47X571	1469-0004		5R5T4			MS-34	
C22	2700		47X492	SI2700	D6-272		GP2-333-272	UC-5227	5HK-D27	
C23A	50		47X112	SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
B	50			SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C24	.05	200	B66503	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C25	68	500	47X471	1468-00007	D6-680	5W5Q7	GP1K-680	UC-5468	1FM-47	
C26	.02	200	B66203	P288-02	DF-203	PJ2S2		PT412	2TM-S2	
C27	.005	400	D66502	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C28	.1	400	D66104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C29A	.02									
B	250		♦76X5						♦102C1	
C										
C30	.01	200	B66103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C31	.005	800	H66502	P1088-005		PTE16D5		PT1625	MB-D5	

♦ Items C29A, C29B, C29C, R23A, R23B are combined in one unit.
When replacing items separately, C29B and C29C should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	40X341	Q11-137	AG-61-S	AB-69	U-54	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	500KΩ	½	36X372	Q18-133X	AT-88	BTSK-66-S	UT-429	Volume Tap ⓐ 75KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	76-1	SW-A	Not Req.	US-26	Attach to R2A

CHASSIS—TOP VIEW



PROPERTY OF
383rd AIRWAYS COMMUNICATIONS SQUADRON
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA AIRLINE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R3	220Ω	1/2	B84221	BTS-220	
R4	100KΩ	1/2	B85104	BTS-100K	
R5	470KΩ	1/2	B85474	BTS-470K	
R6	47Ω	1/2	B85470		
R7	22KΩ	1/2	B85223	BTS-22K	
R8	5600Ω	1/2	B85562	BTS-5600	
R9	68Ω	1/2	B84680		
R10	6800Ω	1/2	B84682	BTS-6800	
R11	1000Ω	1/2	B85102	BTS-1000	
R12	1 Meg	1/2	B85105	BTS-1 Meg	
R13	47KΩ	1/2	B85473	BTS-47K	
R14	270KΩ	1/2	B84274	BTS-270K	
R15	68Ω	1/2	B84680		
R16	3900Ω	1/2	B84392	BTS-3900	
R17	27KΩ	1/2	B85273	BTS-27K	
R18	10KΩ	1/2	B84103	BTS-10K	
R19	10KΩ	1/2	B84103	BTS-10K	
R20	100KΩ	1/2	B85104	BTS-100K	
R21	15KΩ	1/2	B85153	BTS-15K	
R22	10 Meg	1/2	B85106	BTS-10 Meg	
R23A	470KΩ	1/2	♦ 76X5	BTS-470K	
R23B	470KΩ	1/2	♦ 76X5	BTS-470K	
R24	47KΩ	1/2	B85473	BTS-47K	
R25	270Ω	1/2	B84271	BTS-270	
R26	820Ω	2	D84821	BTB-820	

♦ Items R23A, R23B, C29A, C29B, C29C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117V @ .39A	348VCT .076ADC	6.3V @ 3.2A		53X322		P-3048		R-8B

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	6.2KΩ	3.3Ω	440Ω	.78Ω	51X134-2	A-3879 ①	A-2900 ①	RO-16 ①	S-11X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA AIRLINE PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.3Ω	12A480	10J11	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No.	MERIT PART No.	IRC PART No.	NOTES
L1	FM Ant. Coil	.22Ω		35A9		CLA	.47 Microhenries
L2	FM RF Choke	3Ω		35A8		CLA	3.3 Microhenries
L3	FM RF Coil	0Ω		9A2066			
L4	FM Osc. Coil	0Ω		9A2067			
L5	Parasitic Choke	0Ω		9A2103			
L6	AM Loop Ant.	1.1Ω		9A2146			
L7	Cathode Choke	1.8Ω		35A5		CLA	2.2 Microhenries
L8	AM Osc. Coil	.2Ω	4.8Ω	9A2065			
L9	1st. FM IF	.8Ω	.8Ω	9A2060	FM-254		
L10	1st. AM IF	12.5Ω	14Ω	9A2062	BC-352		
L11	2nd. FM IF	.8Ω	.8Ω	9A2276	FM-254		
L12	2nd. AM IF	12.5Ω	14Ω	9A2063	BC-353		
L13	Ratio Det.	2Ω	0Ω CT	9A2260	FM-252		Tertiary Winding - .3Ω

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA AIRLINE PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M1	60H17	ACD-J	A-1, A-3	W22AB	A65MB A62A	96-T	0-1 or S-1 and 0-3 or S-3	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

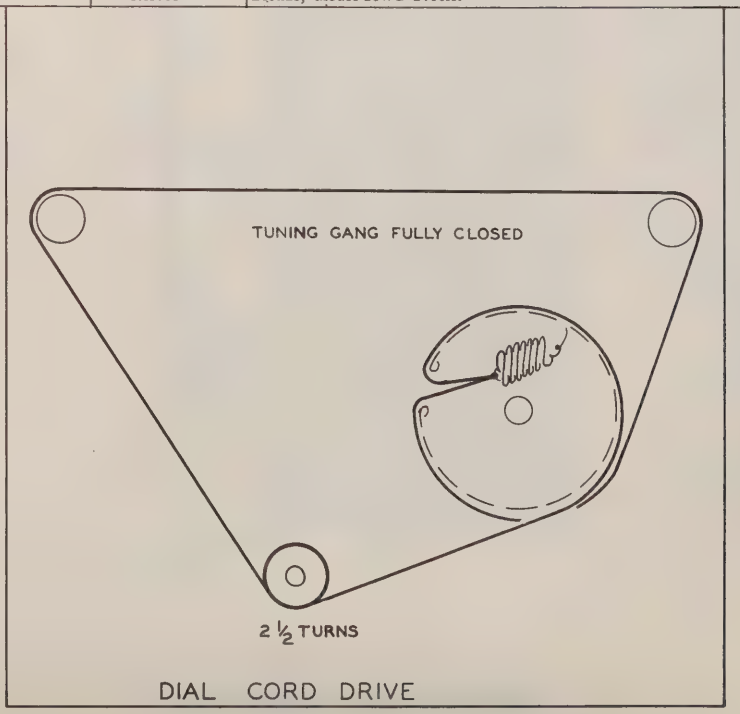
ITEM No.	REPLACEMENT DATA AIRLINE PART No.	REPLACEMENT DATA WALCO PART No.	REPLACEMENT DATA JENSEN PART No.	REMARKS
M2	*61H2 †61H13	W-30 A and W-30MGS	JP.30 and JPS-30LP	* Standard Needle †Microgroove Needle

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA AIRLINE PART No.		NOTES
M3	Bayonet	6-8	.15	Brown	7A103		Type No. 47
M4	Bayonet	6-8	.15	Brown	7A103		Type No. 47

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M5	Tuning Capacitor	14A209	17-507MMF, 14-187MMF
M6	Switch	2A393	Phono-AM-FM Selector
A6	Trimmer Capacitor	17A256	Loop Antenna, 2-24MMF
A13	Trimmer Capacitor	17A255	FM Oscillator, 1-8MMF
	Escutcheon	4X1191	
	Dial Glass	58X741	
	Pointer	15X251	
	Knob	10A759	Mahogany, Model 25WG-2758C.
	Knob	10A765	Blonde, Model 25WG-2766A.



DIAL CORD DRIVE

PHOTOFACT* Folder

ARVIN MODELS
6213TM, 6215CB, CM (Ch. TE-319)

...RTY OF
...ENSHIP

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 6213TM

ARVIN MODELS
6213TM, 6215CB, CM (Ch. TE-319)

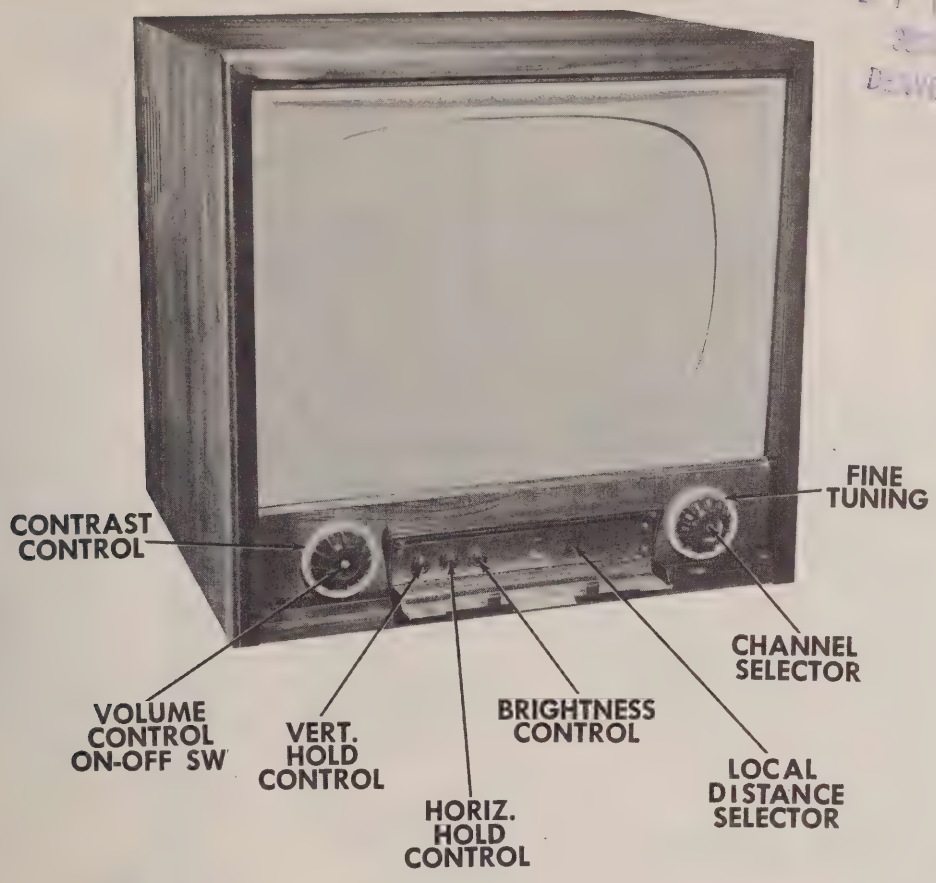
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2–53 SET 195 FOLDER 4

ARVIN MODELS
6213TM, 6215CB, CM (Ch. TE-319)

DENVER, COLORADO



ARVIN 6213TM

TRADE NAME	Arvin Models 6213TM, 6215CB, 6215CM (Ch. TE-319)
MANUFACTURER	Arvin Industries, Columbus, Indiana
TYPE SET	Television Receiver
TUBES	Twenty-Two
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2 Amp @ 117 Volts AC
TUNING RANGE	Channel 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier).

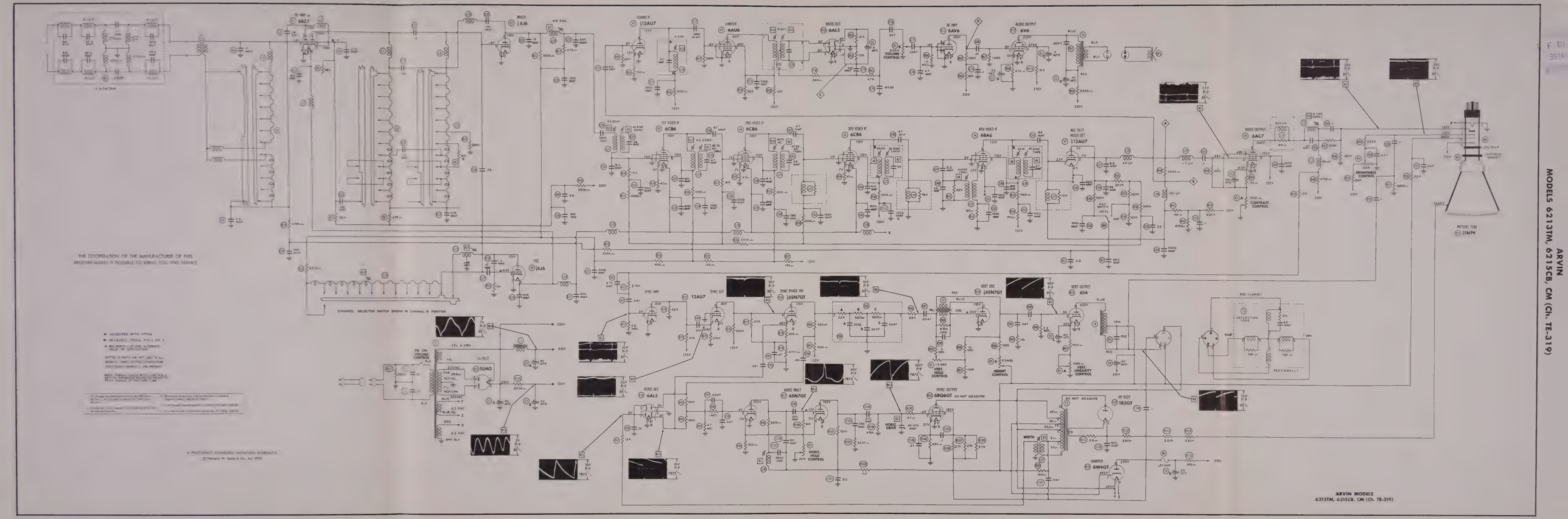
INDEX

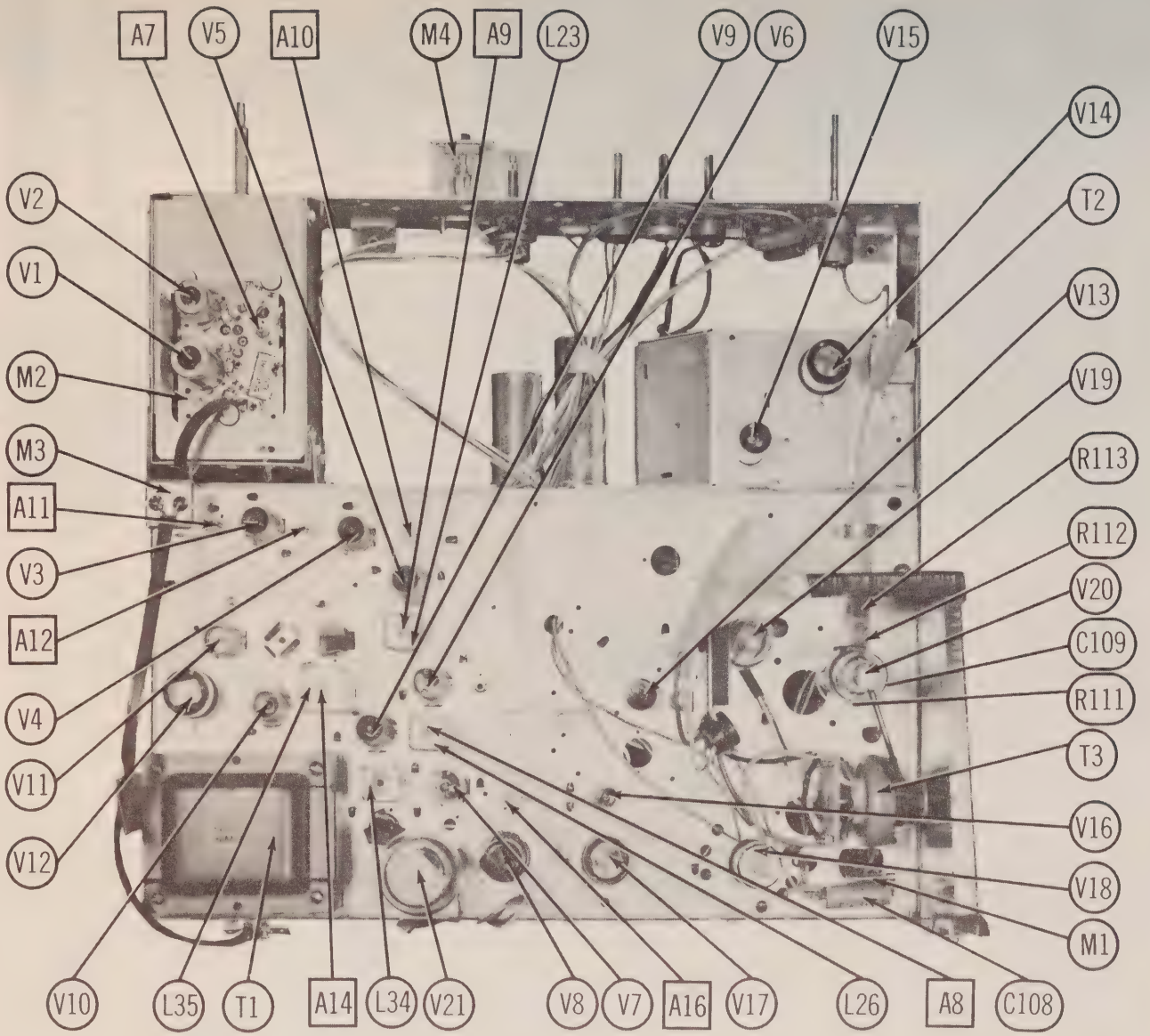
Alignment Instructions 6, 7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 13
Parts List and Descriptions..... 14, 15, 16
Photographs
Cabinet - Rear View 13
Capacitor and Alignment Identification 4, 9
Chassis - Top View 3
RF Tuner 10, 11
Photographs (Cont)
Resistor and Inductor Identification 12, 17
Resistance Measurements 8
Schematic 2
Servicing in the Field 18
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

ARVIN MODELS
6213TM, 6215CB, CM (Ch. TE-319)

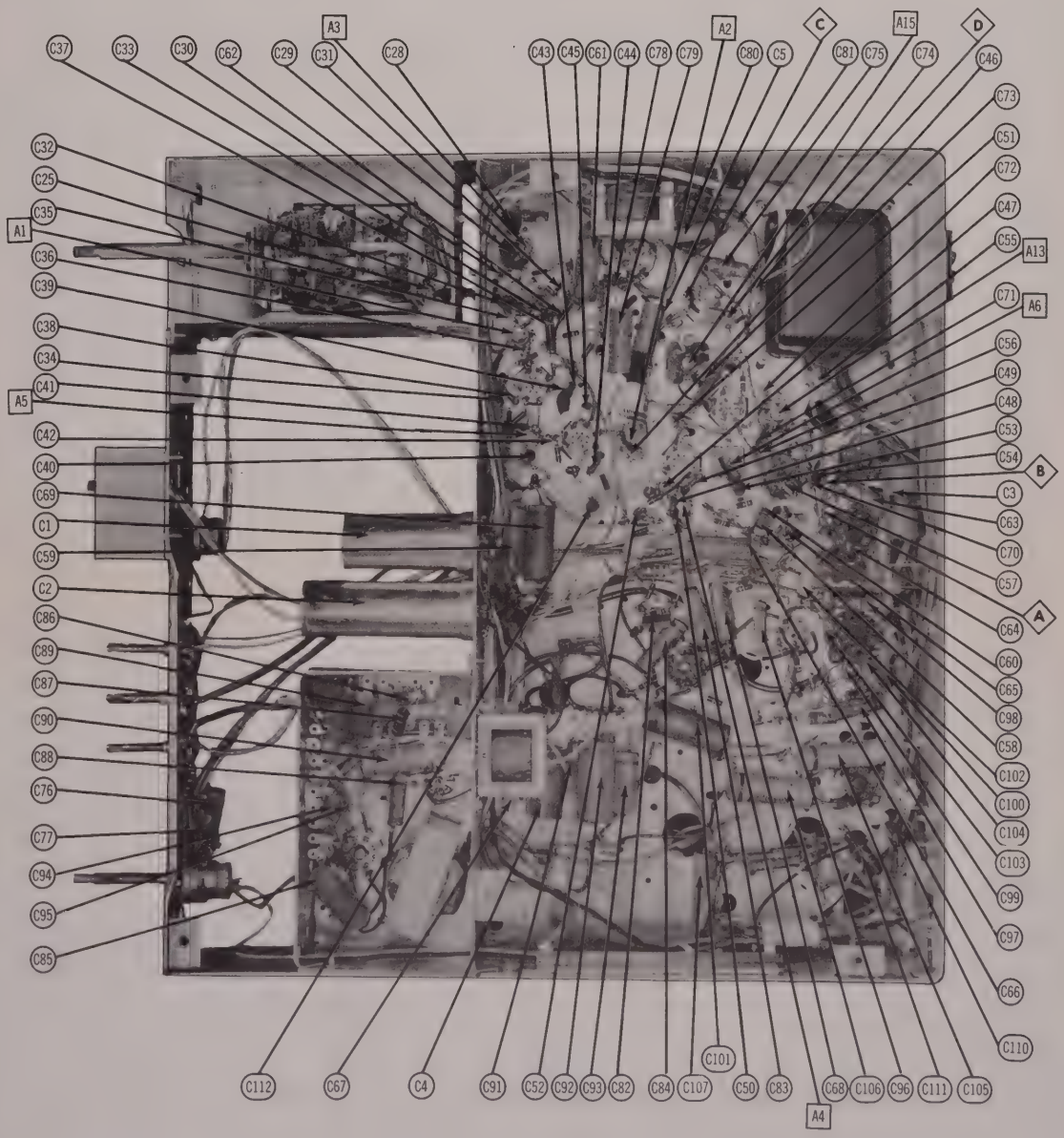
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953
ARVIN MODELS
6213TM, 6215CB, CM (Ch. TE-319)

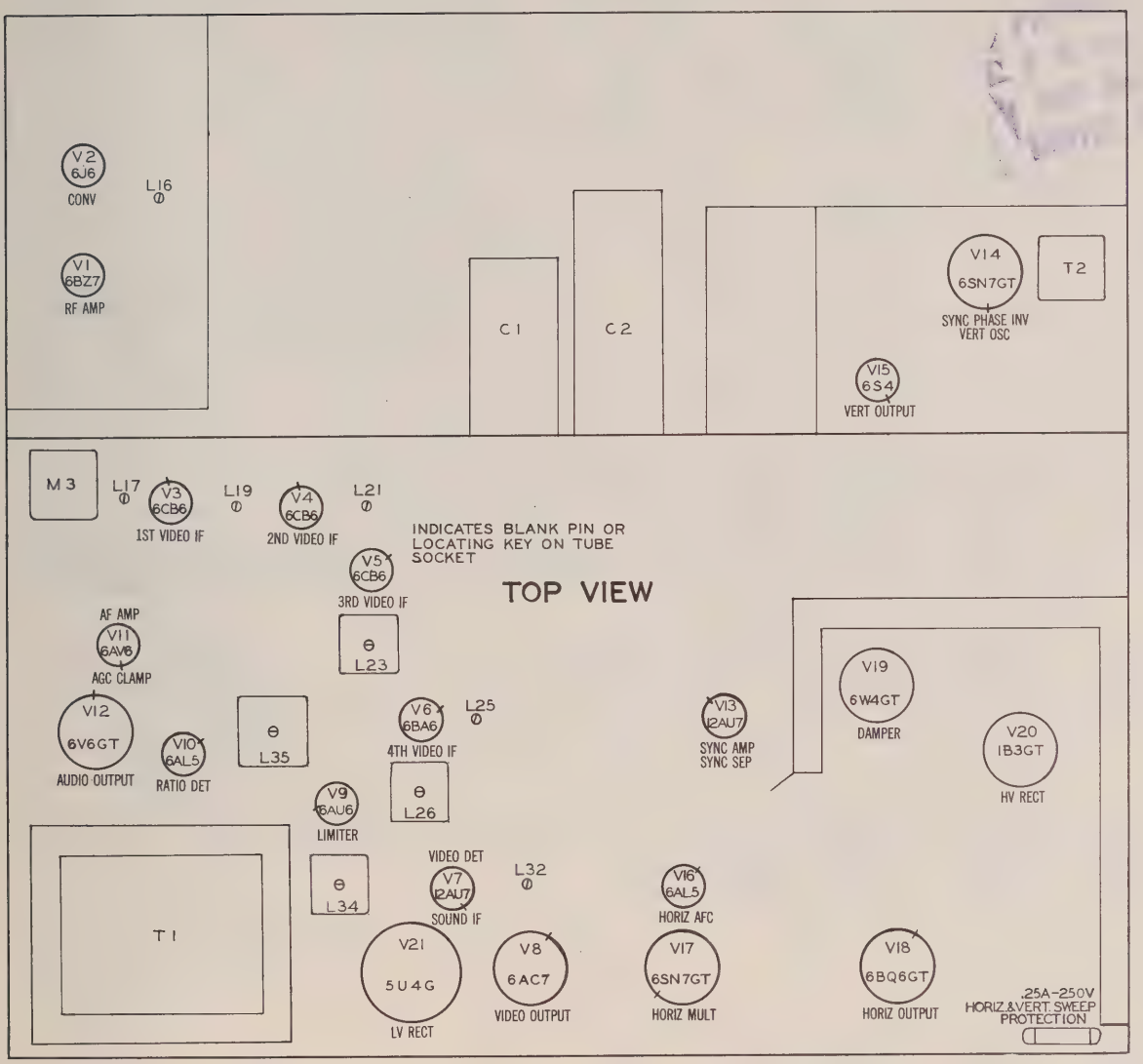


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V21

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6, V7
No pic, no sound has snow-V1, V2, V3
No pic, has sound, has raster-V8, V22
Has pic, no sound-V7, V9, V10, V11, V12
Overloaded picture-V7

SYNC FAILURE
No vert. sync-V14
No horiz. sync-V14, V16, V17
No vert. or horiz. sync-V13, V14

SWEEP FAILURE
No raster, has sund-V17, V18, V19, V20, V22 Fuse (M1)
No vertical deflection-V14, V15
Poor vert. linearity or foldover-V14, V15
Poor horiz. linearity or foldover-V17, V18, V19
Narrow picture-V17, V18, V19, V20, V21
Vert. off freq-V14
Horiz. off freq-V14, V16, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube, V17.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of 3 volt battery to the junction of R35 and R37. Connect the positive lead to chassis.
Set the Local-Distance switch to local position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube V2. Low side to chassis.	39.75MC (Unmod)	Any	DC probe to point ◇A◇. Common to point ◇B◇.	A1, A2	Adjust for MINIMUM deflection.
2.	"	"	41.6MC	"	"	A3, A4	"
3.	"	"	47.25MC	"	"	A5, A6	"
4.	"	"	45.3MC	"	"	A7	Preset core to maximum clockwise position. Adjust for maximum deflection.
5.	"	"	45MC	"	"	A8	Adjust for maximum deflection.
6.	"	"	43.1MC	"	"	A9	"
7.	"	"	45.75MC	"	"	A10	"
8.	"	"	42.25MC	"	"	A11, A12	

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, V2. Low side to chassis.	44MC (10MC Swp)	41.6MC 42.25MC 42.75MC 45.0MC 45.75MC	Any	Vert. Amp. to point ◇A◇. Low side to chassis.		Check for response curve similar to Fig. 1 with markers as shown. If necessary retouch A7 thru A12 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to point ◇A◇. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point ◇C◇. Common to chassis.	A13, A14	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point ◇D◇. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to point ◇A◇. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point ◇C◇. Low side to chassis.	A13, A14	Disconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry as per Fig. 2.
11.	"	"	"	"	"	Vert. Amp. to point ◇B◇. Low side to chassis.	A15	Reconnect capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.001MFD	High side to point ◇A◇. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector (Fig 4) to pin 11 of picture tube. Common to chassis	A16	Adjust for MINIMUM deflection.

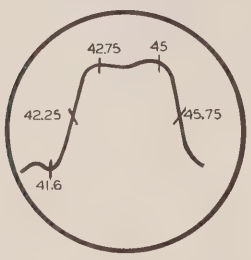


FIG. 1

FIG. 2

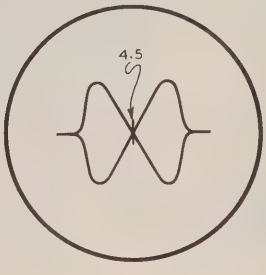


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

PROPERTY OF
L. F. BLANKENSHIP
3921 MEADE ST.
DENVER, COLORADO

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A17	Adjust to place sound marker in notch as in Fig. 5.
14.	"	"	207MC (10MC Swp)	209.75MC	12	"		Check for sound marker placement as in Fig. 5. If necessary make compromise adjustment of A17 for any individual channel then check all other high band channels to see that they have not been affected.
			201MC (10MC Swp)	203.75MC	11			
			195MC (10MC Swp)	197.75MC	10			
			189MC (10MC Swp)	191.75MC	9			
			183MC (10MC Swp)	185.75MC	8			
			177MC (10MC Swp)	179.75MC	7			
15.	"	"	85MC (10MC Swp)	87.75MC	6	"	A18	Adjust to place sound marker in notch as in Fig. 5.
16.	"	"	79MC (10MC Swp)	81.75MC	5			Check for sound marker placement as in Fig. 5. If necessary make compromise adjustment of A18 for any individual channel, then check all other channels to see that they have not been seriously affected.
			69MC (10MC Swp)	71.75MC	4			
			63MC (10MC Swp)	65.75MC	3			
			57MC (10MC Swp)	59.75MC	2			

THE RF AND MIXER PORTIONS OF THIS RECEIVER HAVE BEEN PROPERLY ALIGNED AT THE FACTORY, AND ARE VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

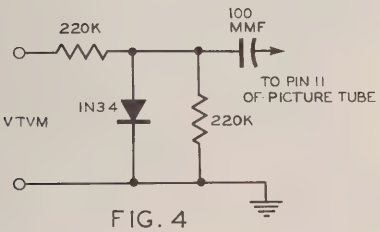


FIG. 4

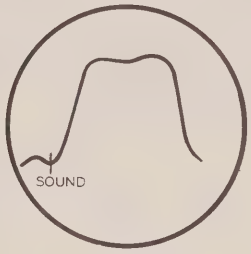
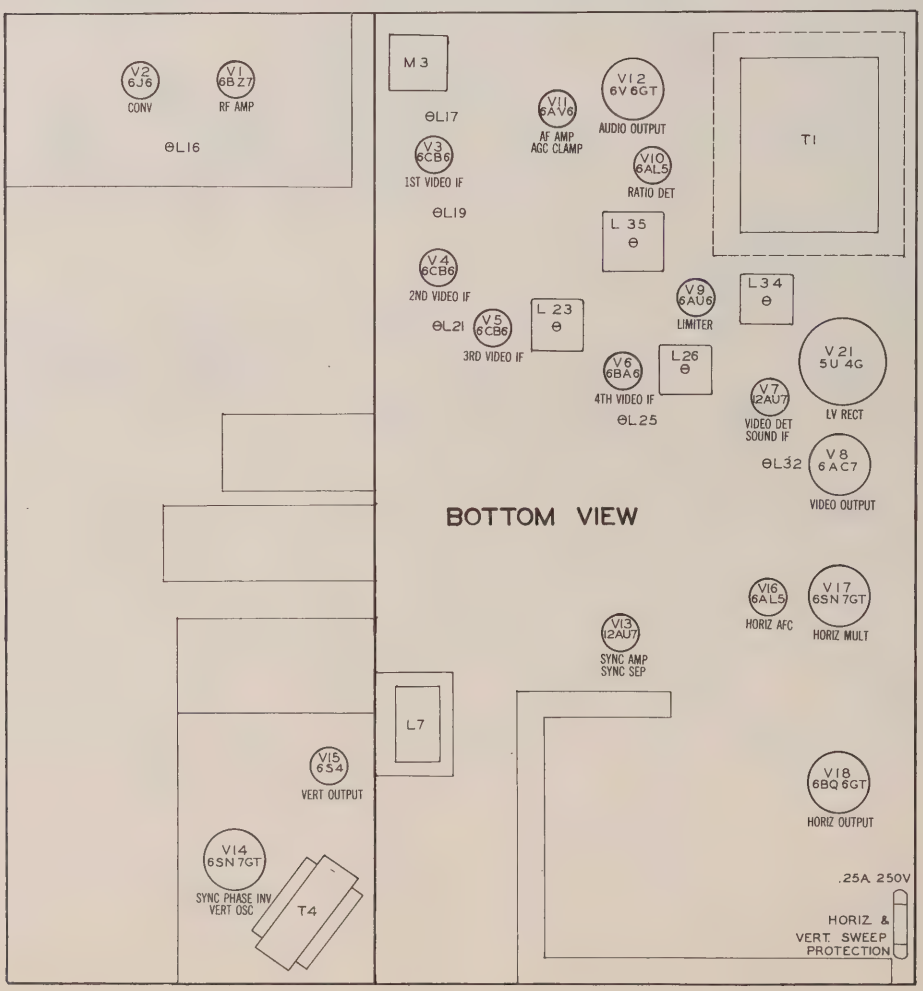


FIG. 5

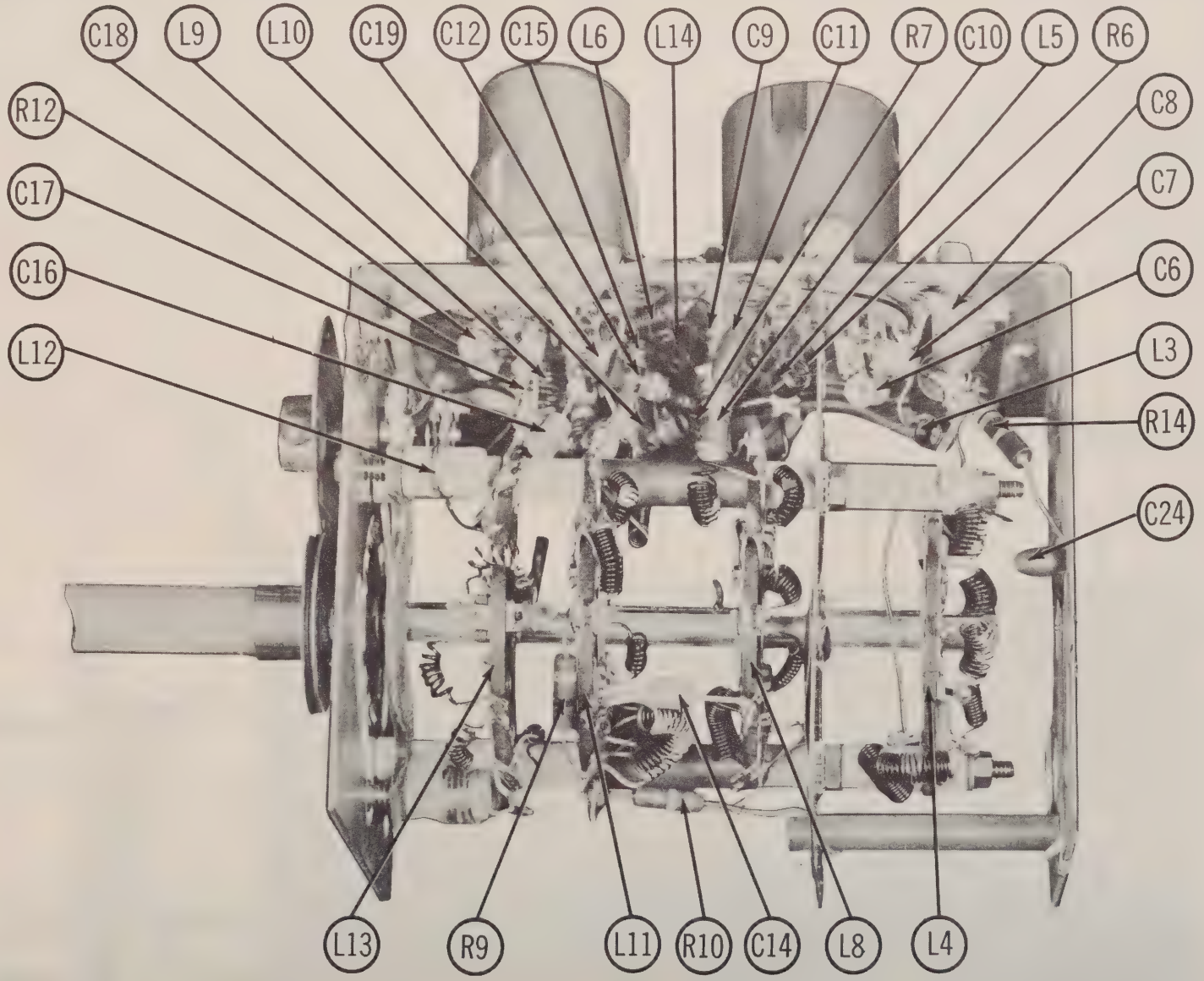
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	† 3.9KΩ	† 433KΩ	INF	.1Ω	0Ω	INF	1.1Meg	0Ω	0Ω
V 2	6J6	† 11.7KΩ	† 3.9KΩ	0Ω	.1Ω	220KΩ	15KΩ	0Ω		
V 3	6CB6	900KΩ	47Ω	0Ω	.1Ω	† 3.5KΩ	† 3.5KΩ	0Ω		
V 4	6CB6	900KΩ	47Ω	.1Ω	0Ω	† 3.4KΩ	† 3.4KΩ	0Ω		
V 5	6CB6	880KΩ	47Ω	0Ω	.1Ω	† 3.2KΩ	† 3.2KΩ	0Ω		
V 6	6BA6	1.7Ω	0Ω	.1Ω	0Ω	† 3.4KΩ	† 3.4KΩ	120Ω		
V 7	12AU7	540KΩ	8.1KΩ	4.8KΩ	.1Ω	.1Ω	† 3.2KΩ	120KΩ	150Ω	0Ω
V 8	6AC7	0Ω	0Ω	7.7Ω	1Meg	158Ω	† 2.2KΩ	1Ω	† 4.8KΩ	
V 9	6AU6	680KΩ	0Ω	.1Ω	0Ω	† 14.2KΩ	† 14.2KΩ	0Ω		
V 10	6AL5	10KΩ	10KΩ	0Ω	.1Ω	INF	0Ω	INF		
V 11	6AV6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	† 250KΩ		
V 12	6V6GT	INF	.1Ω	† 2.5KΩ	† 15.1KΩ	1Meg	INF	0Ω	470Ω	
V 13	12AU7	† 27KΩ	2.2Meg	0Ω	.1Ω	.1Ω	† 67KΩ	0Ω	270KΩ	0Ω
V 14	6SN7GT	2.2Meg	#1.8Meg	0Ω	51KΩ	† 4.8KΩ	5.8KΩ	.1Ω	0Ω	
V 15	6S4	INF	2.8KΩ	INF	.1Ω	0Ω	2.2Meg	INF	INF	#3.4KΩ
V 16	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	12KΩ	0Ω	12KΩ		
V 17	6SN7GT	5.7Meg	#25KΩ	1.2KΩ	110KΩ	#137KΩ	1.2KΩ	0Ω	.1Ω	
V 18	6BQ6GT	INF	0Ω	INF	† 9.2KΩ	470KΩ	INF	.1Ω	220Ω	TOP CAP #20Ω
V 19	6W4GT	INF	INF	20Meg	INF	† 227Ω	INF	#25.3Ω	#25.3Ω	
V 20	1B3GT	PINS 1 TO 8 HAVE INF RESISTANCE								TOP CAP #457Ω
V 21	5U4G	INF	19.5KΩ	INF	28.8Ω	#23.8KΩ	27Ω	INF	19.5KΩ	
V 22	21MP4	0Ω	260KΩ	PIN 6 † 2.2KΩ	PIN 10 #23.8KΩ	PIN 11 112KΩ	PIN 12 .1Ω			

† MEASURED FROM PIN 8 OF V21.
# MEASURED FROM PIN 3 OF V19.



TUBE PLACEMENT CHART



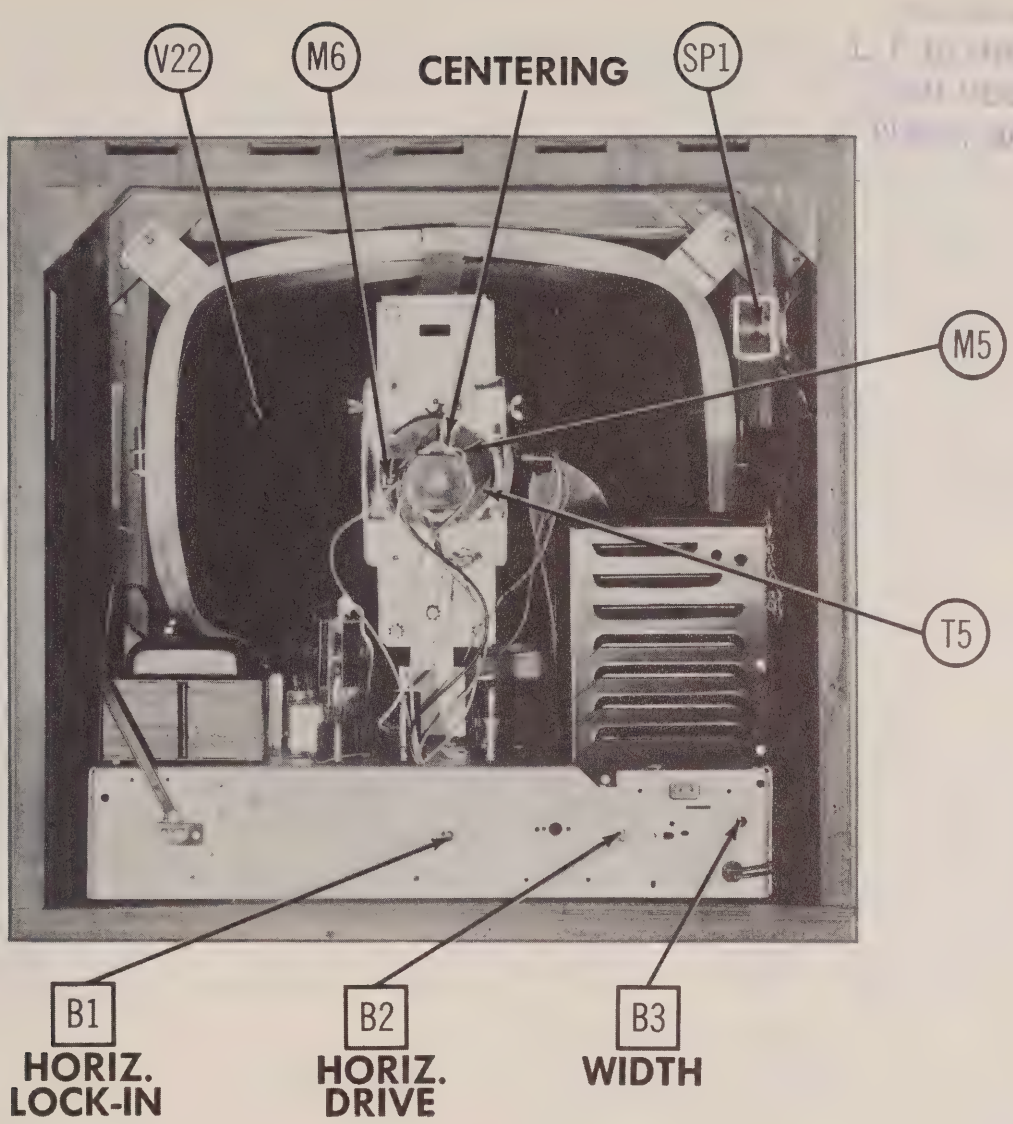
RF TUNER-RIGHT SIDE

RF TUNER–LEFT SIDE

UNIVERSITY OF
...TELEVISION SHIP
...1924 MEADE ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
[illegible] MEADE ST.
DENVER, COLORADO



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the mid-point of its range and adjust the horizontal lock slug (B1) until the picture synchronizes horizontally.

Turn B1 clockwise until picture loses sync, then counter clockwise until picture just falls into sync. Turn the horizontal hold control fully counter clockwise and momentarily switch to another channel and back again. The picture should be out of sync. Note the number of diagonal bars present in the picture. Repeat the procedure with the horizontal hold in extreme clockwise rotation and again note the number of diagonal bars. They should be the same for both positions of the horizontal hold. Adjust B1 for this condition.

Adjust the horizontal drive trimmer (B2) to the maximum counter clockwise position without the presence of a vertical white line or compression of the center of the picture. Adjust the width slug (B3) for picture slightly wider than necessary to fill the picture mask horizontally.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6BZ7	6BZ7	9AJ	
B	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BP	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6BA6	6BA6	6BK	
V7	Video Det. - AGC Rect. - Sound IF Amp.	12AU7	12AU7	9A	
V8	Video Output	6AC7	6AC7	8N	
V9	Limiter	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier - AGC Clamper	6AV6	6AV6	7BT	
V12	Audio Output	6V6GT	6V6GT	7S	
V13	Sync Amplifier - Sync Separator	12AU7	12AU7	9A	
V14	Sync Phase Inv. - Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V15	Vert. Output	6S4	6S4	9AC	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V22	21MP4		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP.	RATING: VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±60	400	E22422-13	AFH4-88			+P431.4	TVL-4709		
B	±50	350		PR8450/40			LTC62			
C	±50	450								
D	20	25								
C2A	±80	350	E22422-14	AFH3-182			FP420.6	TVL-4711		
B	±20	450		PR8450/40			TC75			
C	100	50								
D	±50	350								
C3	40	25	A25454	PRS25/100	-	BH425LA	BR425LA	TVA-1207		
C4	20	450	A25452	PRS450/20		BR2045A	TC75	TVA-1709		
C5	4	150	A25453	PRS150/4		BR415	TC40	TVA-1402		
C6	4					NP0K-040				
C7	1.8									
C8	7.5									
C9	470									
C10	100			S100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C11	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C12	.2									
C13	.56									
C14	1.5									
C15	470			S1470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C16	.39									
C17	18			S10N750	TCN-10		N750K-100	NT-551	5TCU-Q1	
C18	1.5						N330K-1R5			
C19	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C20	100			S100N750	TCN-101			NT-531	5TCU-T1	
C21	5000		C21674	BPD-005	DD-502	TM5D5	81J-005	DC-525	5HK-D5	
C22	15			S15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C23	240	500		1469-00025		5R5T25		MCB240		
C24	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C25	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C26	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C27	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C28	5000		C21674	BPD-005	DD-502	TM5D5	81J-005	DC-525	5HK-D5	
C29	36						N330K-360			
C30	8.2		C20205-13				N90K-8R2			
C31	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C32	610		C20351-1							
C33	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C34	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	47						N330K-470			
C36	47		C20205-19				N220K-470			
C37	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C38	610		C20351-1							
C39	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C40	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C41	39						N330K-390			
C42	47		C20205-19				N220K-470			
C43	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C44	610		C20351-1							
C45	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C46	47		C20205-19				N220K-470			
C47	2.2		C20205-7				N220K-2R2			
C48	36						N330K-360			
C49	610		C20351-1							
C50	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C51	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C52	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C53	68		D25530-13				N220L-680			
C54	5000		C21674	BPD-005	DD-502	TM5D5	81J-005	DC-525	5HK-D5	
C55	.1	200	D25455-104	P288-1	DF-104	P2T4P1		PT401	2TM-P1	
C56	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C57	8.2		C20205-13				N90K-8R2			

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C58	68		D25530-13					N220L-680		
C59	.22	200	D25455-224	P488-22			PTE4P22		PT4025	2TM-P22
C60	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C61	.22	200	D25455-224	P488-22			PTE4P22		PT4025	2TM-P22
C62	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C63	.1	200	D25455-104	P288-1	DF-104	P2T4P1		PT401	2TM-P1	
C64	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C65	47			S147NP0	TCZ-47		NP0K-470	Z7-5447	5TCC-Q47	
C66	.1	400	D25463-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C67	.047	600	D25461-473	P688-047	DF-503	PTE4S47		PT6147	6TM-S47	
C68	.047	600	D25462-473	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C69	.22	400	D25462-224	P488-22		PTE4P22		PT4025	4TM-P22	
C70	68		D25530-13	S168	D6-680		GP1K-680	UC-5468	5GA-Q68	
C71	5000		C21674	BPD-005	DD-502	TM5D5	81J-005	DC-525	5HK-D5	
C72	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C73	5000		C21674	BPD-005	DD-502	TM5D5	81J-005	DC-525	5HK-D5	
C74	500	500	C20390-501	1468-0005	D6-501	5W5T5	GP2K-501	MC245	1FM-35	
C75	.0033	600	D25461-332	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D3	
C76	.047	200	D25455-473	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C77	.0047	600	D25461-472	P688-0047	DF-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C78	47	500	C20411-470	1468-00005	D6-470	5W5Q5	GP1K-470	MC225	1FM-45	
C79	.1	400	D25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C80	.01	600	D25462-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT641	4TM-S1	
C81	.0047	600	D25461-472	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C82	270	500	C20290-271	1468-0003	D6-271	5W5T3	GP2K-271	MC241	1FM-33	
C83	.047	400	D25462-473	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C84	.047	400	D25462-473	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C85	.47	200	D25455-474	P288-47		PJ2P5		PT405	2TM-P47	
C86A	.0022			P688-0022		PTE6D22		PT6222		
B	.0047		∗C24166	P688-0047	∗DC-100	PTE6D47	∗1405-01	PT6247	∗101C1	
C	.0047			P688-0047		PTE6D47		PT6247		
C87	.0047	600	C20324-472	1494-0005		1R5D5		MC8465	MS-25	
C88	.0015	600	D25461-152	P688-0015	D6-152	PTE6D15	GP2L-152	PT6215	6TM-D15	
C89	.047	600	D25461-473	P688-047	DF-503	PTE6S47		PT6147	6TM-S15	
C90	.1	400	D25461-104	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C91	.022	200	D25455-223	P488-022		PTE4S22		PT4122	4TM-S22	
C92	.1	1000	D25470-104	P1089-1		PTE1EP1		PT1601	MB-P1	
C93	.1	400	D25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C94	.001	600	D25461-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C95	.001	400	D25461-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C96	.01	400	D25462-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT641	4TM-S1	
C97	.0047	600	D25455-472	P688-0047	DF-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C98	.047	400	D25462-473	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C99	330	500	C20290-331	1469-00035			5R5T1		MCB235	MS-31
C100	100	500	C20290-101	1469-0001			5R5T1		MCB235	MS-31
C101	.22	600	D25461-224	884-25		PTE6P25		PT6025	6TM-P25	
C102	3900	500	C20433-392	1467-004		IDR5D4		MCB463	MS-24	
C103	330	500	C20290-331	1469-00035						
C104	270	500	C20290-271	1468-0003	D6-271	5W5T3	GP2K-271	MC241	1FM-33	
C105	.1	600	D25461-104	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C106	.47	200	D25455-474	P288-47		PJ2P5		PT405	2TM-P47	
C107	.047	600	D25461-473	P688-047		PTE6S47		PT6147	6TM-S47	
C108	.1	400	D25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C109	500	20000	A24994	HV30C	TV3-502	MDM-C30T5	413-501		20DK-T5	
C110	.01	600	C20358-103	689ZGXY-01		PJ6S1		PT6I	6TM-S1	
C111	.01	600	C20358-103	689ZGXY-01		PJ6S1		PT6I	6TM-S1	
C112	1000		A23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	See Note

∗ Items C86A, C86B, C86C, R82A, R82B, R82C are combined in one unit.
Note- Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1,000Ω		E23464-27	QJ-349*			UF152L	Contrast - Panel
B	250KΩ						UR254A	Volume - Rear
C	Switch						US-26	Attach to R1B.
R2A	1.5Meg		E23464-36	Q1J-138	AG-83-8	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A.
R3A	22KΩ		E23464-38	Q1J-130	AG-40-8	AB-26	U-39	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R3A.
R4A	100KΩ		E23464-34	Q1J-128	AG-49-8	AB-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A.
R5A	3000Ω	2	E23464-20	QJ-71**	RTV-259			Vert. Linearity-Wire Wound
B	2.5Meg							Panel
								Height-Rear

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-110 & P1-204 (Panel), B13-130 & R1-220 (Rear) & SWITCH 76-1.

** CONCENTRIKIT EQUIVALENT - KIT K-3, BASE ELEMENTS & SHAFTS W11-112 & P3-114 (Panel), B11-234 & R2-124 (Rear).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	ARVIN PART No.	IRC PART No.	NOTES
R6	1Meg			BTS-1Meg	
R7	750KΩ 5%				
R8	470Ω			BTS-470	
R9	10KΩ			BTS-10K	See Note.
R10	220KΩ				
R11	8200Ω			BTS-8200	
R12	15KΩ			BTS-15K	
R13	8200Ω			BTS-8200	
R14	4700Ω			BTS-4700	
R15	3300Ω		C20061-332	BTS-3300	
R16	1000Ω		C20061-102	BTS-1000	
R17	470Ω			BTS-470	
R18	15KΩ		C22381-153	BTS-15K	
R19	47Ω		C22381-470		
R20	1000Ω		C20061-102	BTS-1000	
R21	3300Ω		C20061-332	BTS-3300	
R22	150Ω		C20061-151	BTS-150	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	ARVIN PART No.	IRC PART No.	NOTES
R23	18KΩ 5%		C22382-183		
R24	47Ω		C22381-470		
R25	1000Ω		C20061-102	BTS-1000	
R26	3300Ω		C20061-332	BTS-3300	
R27	150Ω		C20061-151	BTS-150	
R28	1000Ω		C20061-102	BTS-1000	
R29	47Ω		C22381-470		
R30	1000Ω		C20061-102	BTS-1000	
R31	22KΩ		C22381-223	BTS-22K	
R32	120Ω		C22381-121	BTS-120	
R33	1000Ω		C20061-102	BTS-1000	
R34	150Ω		C20061-151	BTS-150	
R35	220KΩ		C22381-224	BTS-220K	
R36	560KΩ		C20061-564	BTS-560K	
R37	220KΩ		C22381-224	BTS-220K	
R38	560KΩ		C20061-564	BTS-560K	
R39	100KΩ		C22381-104	BTS-100K	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	ARVIN PART No.	IRC PART No.	NOTES
R40	3300Ω 5%		C22382-332	BTS-3300 5%	
R41	100Ω		C22381-101	BTS-100	
R42	4700Ω		C22381-472	BTS-4700	
R43	220KΩ		C20061-224	BTS-220K	
R44	1Meg		C20061-105	BTS-1Meg	
R45	150Ω		C22381-151	BTS-150	
R46	4700Ω 5%	2	C25467-472	BTS-4700 5%	
R47	330KΩ		C22381-334	BTS-330K	
R48	220KΩ		C22381-224	BTS-220K	
R49	220KΩ		C22381-224	BTS-220K	
R50	22KΩ		C22381-223	BTS-22K	
R51	8200Ω		C22381-822	BTS-8200	
R52	100KΩ		C22381-104	BTS-100K	
R53	3300Ω			BTA-3300	
R54	120KΩ		C22381-124	BTS-120K	
R55	150Ω		C20061-151	BTS-150	
R56	1000Ω		C22382-102	BTS-1000	
R57	680KΩ		C20061-684	BTS-680K	
R58	12KΩ	1	C20070-123	BTA-12K	
R59	220KΩ	1	C20070-224	BTA-220K	
R60	390Ω 5%	1	C22382-391	BTS-390 5%	
R61	47KΩ		C22381-473	BTS-47K	
R62	10KΩ 5%		C22382-103	BTS-10K 5%	
R63	10KΩ 5%		C22382-103	BTS-10K 5%	
R64	10Meg		C20061-106	BTS-10Meg	
R65	150KΩ		C22381-154	BTS-150K	
R66	100KΩ		C22381-104	BTS-100K	
R67	1Meg		C20061-105	BTS-1Meg	
R68	470Ω		C20070-471	BTA-470	
R69	2200Ω	2	C25288-222	BTB-220	
R70	10KΩ		C20061-103	BTS-10K	
R71	270KΩ		C22381-274	BTS-270K	
R72	2.2Meg		C22381-225	BTS-2.2Meg	
R73	47KΩ		C20070-473	BTA-47K	
R74	22KΩ		C22381-223	BTS-22K	
R75	270KΩ		C22381-274	BTS-270K	
R76	560KΩ		C22381-564	BTS-560K	
R77	47KΩ		C22381-473	BTS-47K	
R78	10000 5%		C22382-112	BTS-1000 5%	
R79	4700Ω		C22381-472	BTS-4700	
R80	820Ω		C22381-821	BTS-820	

∗ Items R82A, R82B, R82C, C86A, C86B, C86C are combined in one unit.
Note. Not used in all Models.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No	TRIAD PART No
T1	117V AC ② 2A	650VCT ② .280ADC	5V AC ③ 3A	6.3V AC ④ 8A 6.3V AC ⑤ 1.2A 6.3V AC ⑥ 1.1A	E-25433	P-8166 ①	P-3070	TP-319	, R-39BC

① Parallel the two 6V windings and use as Sec. 3

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	180Ω	1050Ω	C22446-1	A-8122 ①	A-4003	TSO-3 ①	A-97Y	Vert. Osc. Trans.
T3	437Ω tap ② 20Ω	360Ω tap ③ 3.7Ω, 11.7Ω, 31.7Ω	E24989		HVO-9	TFB-13	D-19	Horiz. Output Trans.
		SEC. 2 0Ω						
T4	1560Ω tap ④ 4.2Ω		C24990-1	A-8141	A-3039	TSO-12	A-104X	Vert. Output Trans.
T5A	24Ω		D24807			TY-5	Y-19	Horiz. Deflection Coils
B	46Ω							Vert. Deflection Coils

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI	RATING: DC RES. SEC.	ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	4.5KΩ	3.4Ω	300Ω	.4Ω	C-24776-1	A-3849	A-3019	RO-9 ①	S-5X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V C IMP.	ARVIN PART No	JENSEN PART No.	QUAM PART No	NOTES
SP1	6	PM	3.4Ω	D-23405 D-25519 ①	ST-108 Mod. P8-X	6A1	① Alternate 10" PM Speaker

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~/s)	ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.150ADC	127Ω	2.9 Hy.	C-23087-1	C-2327 ①	C-2991 ①	TR-3300 ①	C-13X ①

① Drill one new mounting hole.

ARVIN
MODELS 6213TM, 6215CB, CM (Ch. TE-319)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	ARVIN PART No.	MERIT PART No.	IRC PART No.	
L2	Ant. Trans.	.2ΩCT	.1Ω				
L3	Ant. Coil	0Ω					Channel 13
L4	Ant. Coils	0Ω					
L5	Neutralizing Coil	0Ω					
L6	Fil. Choke	0Ω		A22456			
L7	RF Coil	0Ω					Channel 13
L8	RF Coils	0Ω					
L9	Mixer Grid Coil	0Ω					Channel 13
L10	Feedback Coil	.1Ω					
L11	Mixer Grid Coils	0Ω					
L12	Osc. Plate Coil	0Ω					Channel 13, tapped
L13	Osc. Coils	0Ω					
L14	Fil. Choke	0Ω		A22456			
L15	Fil. Choke	.2Ω				CL-1	.56 Microhenry
L16	Conv. Plate	.1Ω					
L17	1st. Video IF	0Ω		C25410			Includes Trap
L18	Fil. Choke	0Ω		A23095			
L19	2nd. Video IF	0Ω		C25411			Includes Trap
L20	Fil. Choke	0Ω		A23095			
L21	3rd. Video IF	0Ω		C25412			Includes Trap
L22	Grid Choke	1.7Ω		E22500-19	TV-180 *		20 Microhenries, wound on 18KΩ resistor
L23	4th. Video IF	.1Ω		C25413			Includes Trap
L24	Grid Choke	1.7Ω		E22500-19	TV-180 *		20 Micrhenries, wound on 18KΩ resistor
L25	Cathode Trap	0Ω	0Ω	C25415			
L26	5th. Video IF	0Ω		C25474			Includes Trap
L27	Cathode Choke	1.7Ω		D22500-8	TV-180 ■		20 Microhenries, wound 12KΩ resistor
L28	Series Peaking Coil	2Ω		D25468-6	TV-180		40 Microhenries
L29	Series Peaking Coil	.2Ω		A25916	TV-189		1.7 Microhenries
L30	Shunt Peaking Coil	4.2Ω		D25468-5	TV-181		100 Microhenries
L31	Series Peaking Coil	7.3Ω		D25468-8	TV-185 ■		250 Microhenries, wound on 16KΩ resistor
L32	4.5MC Trap	1Ω		C25609	TV-151		
L33	Shunt Peaking Coil	6Ω		D25468-1	TV-184		185 Microhenries
L34	Sound IF	1.2Ω		C25543			
L35	Ratio Det.	3.4Ω	.1Ω CT	C25322	TV-110		Tertiary Winding - .65Ω
L36	Horiz. Osc.	63Ω		C23449	TV-163		
L37	Width Coil	18Ω	11Ω	C40027			

▲ Parallel with 16KΩ resistor
* Parallel with 18KΩ resistor
■ Parallel with 12KΩ resistor

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ARVIN PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG (P/T)	1/4A 250V			318.250 (1/4A-P/T)		GJV-1/4	

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M2	RF Tuner	E25702-1	
M3	Trap Assembly	C25963	IF and FM
M4	Switch	A25525	Local-Distance
M5	Centering Magnet	D25626	
M6	Ion Trap	C25662-1	
B2	Trimmer Capacitor	A24528	Horiz. Drive, 40 MMF-370MMF
	Control Door Assy.	AE40169-1	Mahogany
	Control Door Assy.	AE40169-2	Blonde
	Safety Glass	E24947	
	Mask	R40382	
	Knob	D40170-1	Channel Selector
	Knob	D40170-3	Channel Selector, Blonde
	Knob	D40171-1	Off/On Volume
	Knob	D40171-3	Off/On Volume, Blonde
	Knob	D23604	Contrast
	Knob	D23605	Fine Tuning
	Knob	C24699-2	Vert. Hold, Horiz. Hold, Brightness (3 Used)
	Back Cover	AE40045-2	

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs.

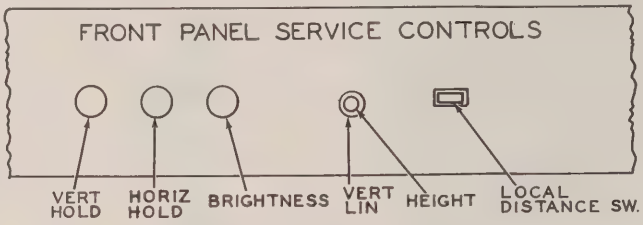
PICTURE TUBE SAFETY GLASS CLEANING

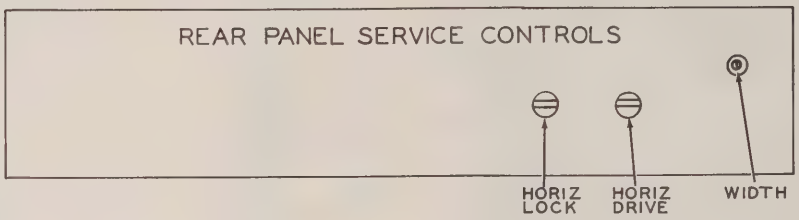
To clean safety glass and picture tube, remove metal strip holding safety glass. Remove safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of Horiz. Frequency Slug can be made from rear of chassis. See location above. For correct adjustment procedure, see Horizontal Sweep Circuit adjustments.

DISCRIMINATOR ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary (L35) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for Horiz. Sweep Circuit protection. For location see Tube Placement Chart.

CENTERING

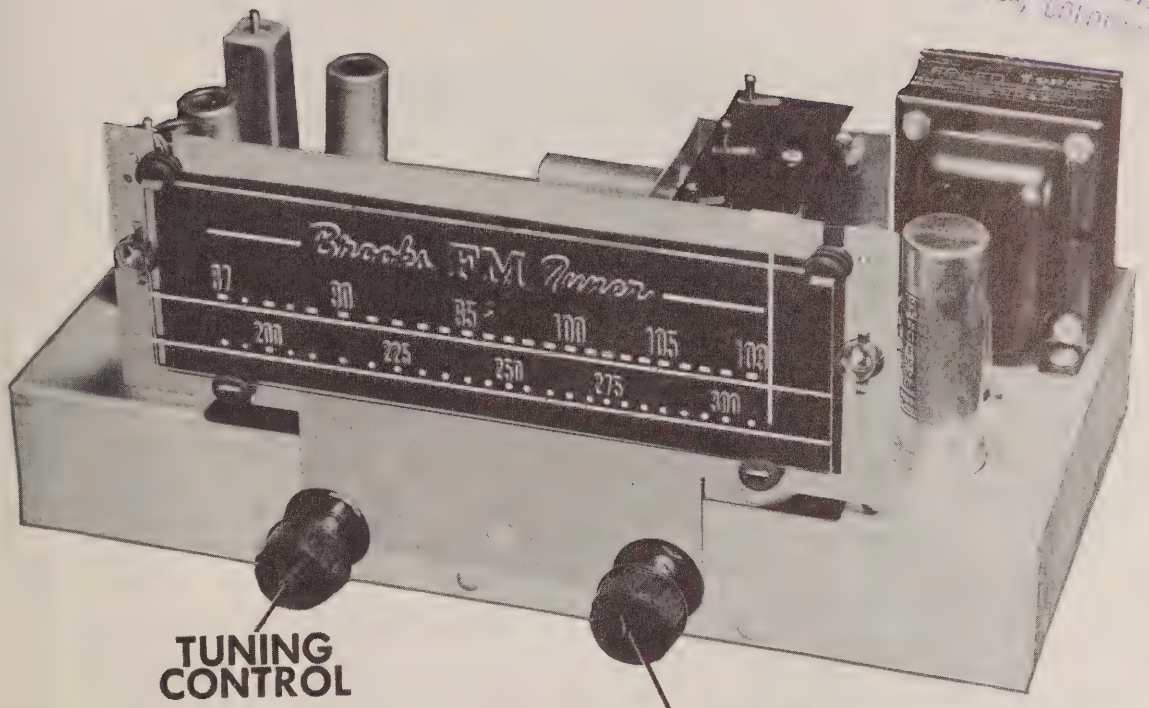
Centering is accomplished by the adjustment of a permanent magnet ring located just behind the deflection yoke. Rotate centering ring to obtain proper centering.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front cover.
2. Disconnect built-in antenna. Remove 6 wood screws. Remove rear cover.
3. Disconnect speaker. Remove 4 nuts. Remove speaker.
4. Remove 1 screw, disconnect yoke plug.
5. Disconnect CRT socket and HV lead.
6. Remove 1 metal screw from yoke bracket support, 6 chassis bolts. Remove chassis.
7. For picture tube removal it is necessary to remove chassis as described above.

PROPERTY OF
L. F. BLANKENSHIP
3974 MEADE ST.
DENVER, COLORADO

BROOKS LABS
MODEL ST-10

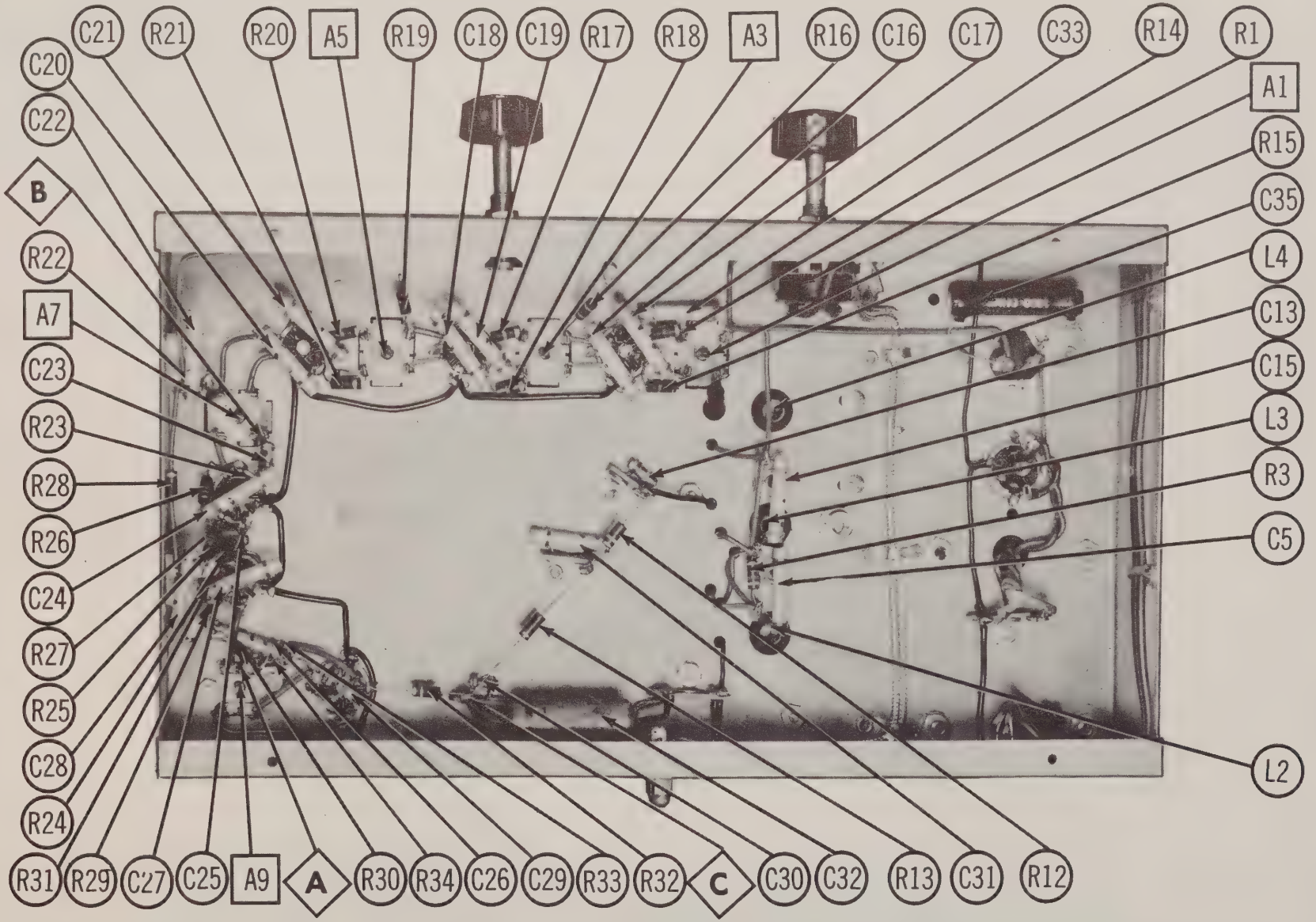


BROOKS LABS
MODEL ST-10

TRADE NAME	Brooks Model ST-10
MANUFACTURER	Brooks Laboratories, Inc., 621 Main'St., Waltham, Mass.
TYPE SET	AC Operated FM Superheterodyne Tuner For Custom Installation
TUBES (Ten)	Types 6CB6 RF Amp., 6J6 Osc, -AFC, 6BE6 Mixer, (3) 6CB6 IF Amp. (2) 6AU6 Limiter, 6AL5 Discrimmator, 6X4 Rectifier.
POWER SUPPLY	110-120 Volts AC RATING .52 Amp. @ 117 Volts AC
TUNING RANGE	Freq. Mod. 87-109MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



CHASSIS BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn tuning knob counter clockwise to end of slug carriage travel and set pointer midway between the "8" and "7" of "87" on the dial scale.
Turn tuning knob clockwise to end of slug carriage travel and set the bottoms of the brass tuning slugs 5/8" inch from the underside of the coil forms.

IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	10.7MC (Unmod.)	Point of noninterference	DC probe thru 1Meg to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5, A6, A7, A8,	Adjust for maximum deflection.
2.	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A9	"
3.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.001MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	10.7MC (450KC Swp)	Point of non-interference.	Vert. Amp. thru 1Meg to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5, A6, A7, A8	Adjust for curve of maximum amplitude and symmetry with center at 10.7MC as in Fig. 1. Attenuate generator as needed to avoid distortion of response curve.
2.	"	"	"	"	Vert. Amp. to point Ⓒ Low side to chassis.	A9, A10	Adjust A9 for crossover lines of maximum amplitude and straightness. Adjust A10 so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines. Continue alignment with step 4.

RF ALIGNMENT

Connect a short across C31 to disable the AFC
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	270Ω Carbon Resistors	High side thru 270Ω to right hand antenna terminal (as viewed from rear of chassis) Low side to left hand terminal.	100MC (Unmod)	100MC	DC probe thru 1 Meg to point Ⓐ Common to chassis.	A11	Adjust for maximum deflection.
5.	"	"	"	"	"	A12, A13	Attenuate generator for output below that necessary for limiting at point Ⓐ. Adjust A12 and A13 for maximum deflection.

FIG. 1

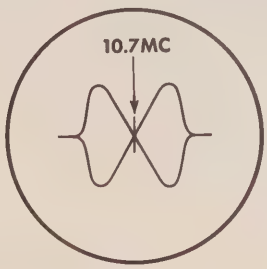
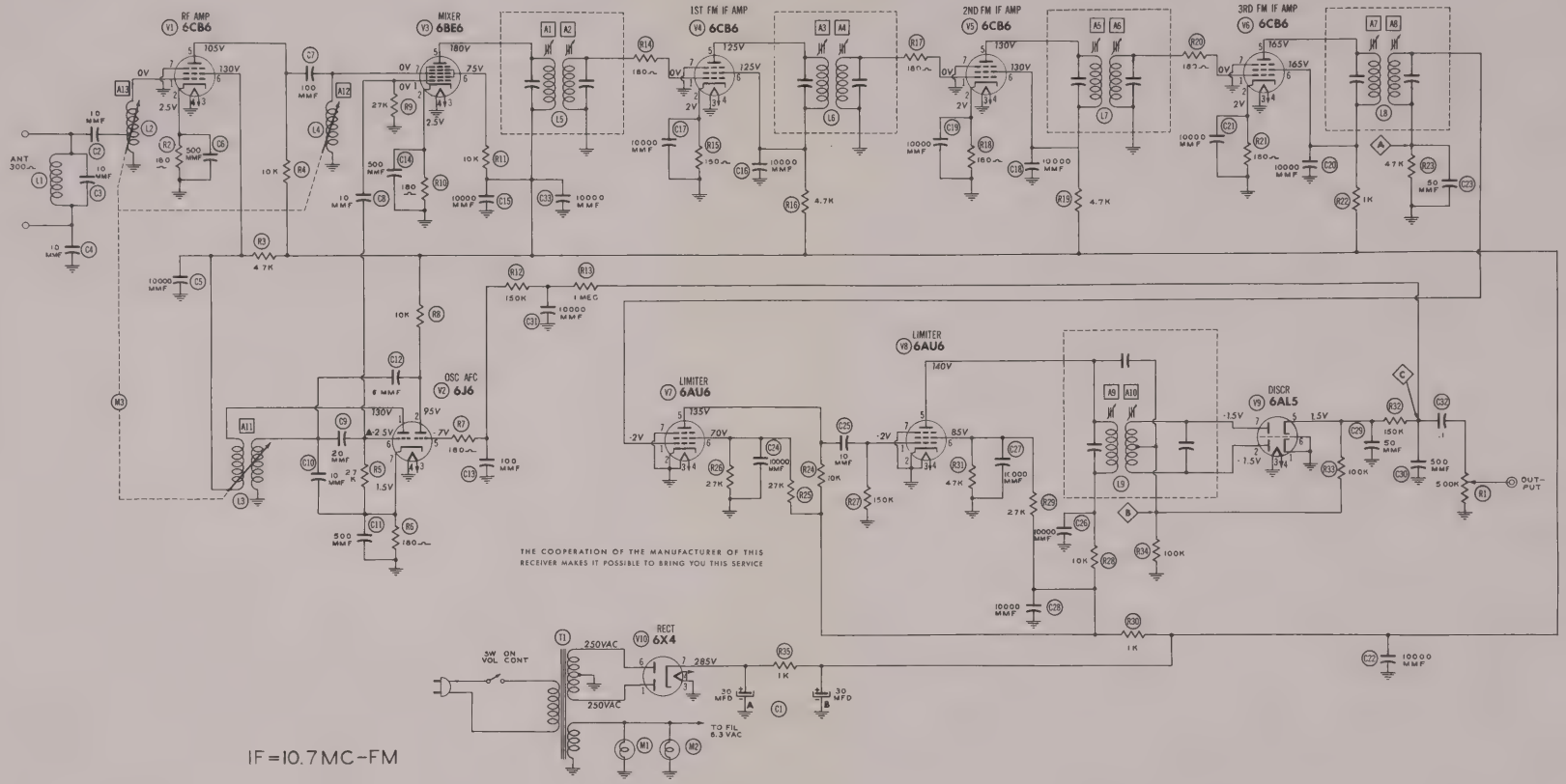


FIG. 2



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6CB6	0Ω	180Ω	1Ω	0Ω	11KΩ	15.7KΩ	0Ω
V 2	6J6	15.7KΩ	11KΩ	1Ω	0Ω	1.5Meg	27KΩ	180Ω
V 3	6BE6	27KΩ	180Ω	1Ω	0Ω	11KΩ	11KΩ	0Ω
V 4	6CB6	180Ω	180Ω	0Ω	1Ω	15.7KΩ	15.7KΩ	0Ω
V 5	6CB6	180Ω	180Ω	0Ω	1Ω	15.7KΩ	15.7KΩ	0Ω
V 6	6CB6	180Ω	180Ω	0Ω	1Ω	12KΩ	12KΩ	0Ω
V 7	6AU6	47KΩ	0Ω	0Ω	1Ω	112KΩ	130KΩ	0Ω
V 8	6AU6	150K Ω	0Ω	0Ω	1Ω	112KΩ	130KΩ	0Ω
V 9	6AL5	0Ω	100KΩ	0Ω	1Ω	200KΩ	0Ω	100KΩ
V 10	6X4	136Ω	DNF	0Ω	1Ω	DNF	141 Ω	33KΩ

† MEASURED FROM PIN 1 OF V10
▲ TAKEN WITH VACUUM TUBE VOLTMETER

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953

195-5

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		BROOKS PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6CB6	6CB6	7CM	
V2	Oscillator-AFC	6J6	6J6	7BF	
V3	Mixer	6BE6	6BE6	7CH	
V4	lst. FM IF Amp.	6CB6	6CB6	7CM	
V5	2nd. FM IF Amp.	6CB6	6CB6	7CM	
V6	3rd. FM IF Amp.	6CB6	6CB6	7CM	
V7	Limiter	6AU6	6AU6	7BK	
V8	Limiter	6AU6	6AU6	7BK	
V9	Discriminator	6AL5	6AL5	6BT	
V10	Rectifier	6X4	6X4	5BS	

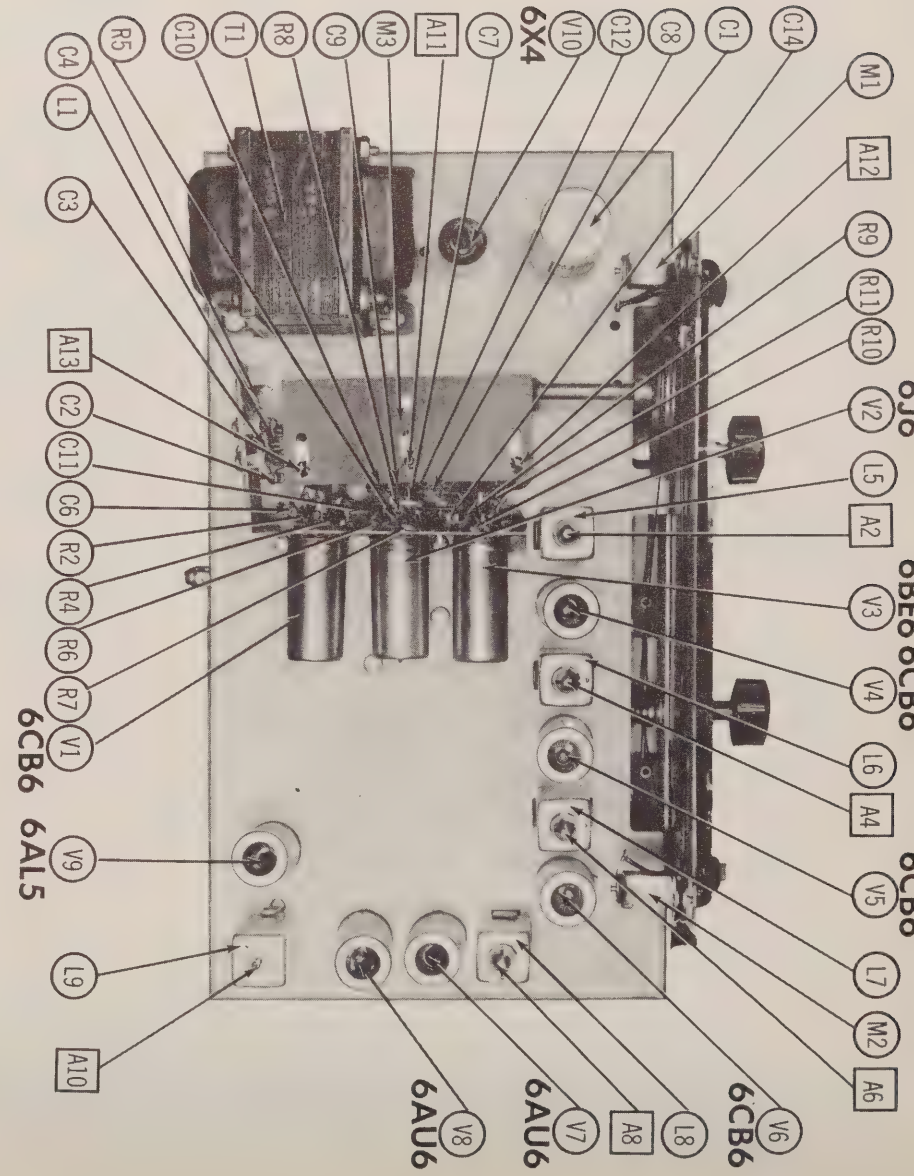
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	BROOKS PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■30	350		AFH2-83		BO31		FP227.3	TVL-2621	
B	▲30	300								
C2	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C3	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C4	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C5	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C6	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C7	100			SI100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C8	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C9	20			SI20N750	TCN-20		N750K-200	NT-542	5TCU-Q2	
C10	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C11	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C12	6						NP0K-060			
C13	100			SI100N750	TCN-100		N750L-101	NT-531	5TCU-T1	
C14	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C15	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C16	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C17	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C18	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C19	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C20	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C21	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C22	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C23	50			SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C24	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C25	10			SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	Note 1
C26	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C27	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C28	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C29	50			SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C30	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C31	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	
C32	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C33	10000			SI10000	D6-103	TM5S1	GP2-333-103	DC-511	5HK-S1	Note 2

Note 1. Some Models use 20MMF in this application.
Note 2. Not used in all Models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BROOKS PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	34-011-560	Q13-137	AG-60-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BROOKS PART No.	IRC PART No.	
R2	180Ω	½		BTS-180	
R3	4700Ω	½		BTS-4700	
R4	10KΩ	½		BTS-10K	
R5	27KΩ	½		BTS-27K	
R6	180Ω	½		BTS-180	
R7	180Ω	½		BTS-180	
R8	10KΩ	½		BTS-10K	
R9	27KΩ	½		BTS-27K	
R10	180Ω	½		BTS-180K	
R11	10KΩ	½		BTS-10K	
R12	150KΩ	½		BTS-150K	
R13	1 Meg	½		BTS-1 Meg	
R14	180Ω	½			
R15	180Ω	½		BTS-180	
R16	4700Ω	½		BTS-4700	
R17	180Ω	½			
R18	180Ω	½		BTS-180	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	BROOKS PART No.	IRC PART No.	
R19	4700Ω	½		BTS-4700	
R20	180Ω	½			
R21	180Ω	½		BTS-180	
R22	1000Ω	½		BTS-1000	
R23	47KΩ	½		BTS-47K	
R24	10KΩ	½		BTS-10K	
R25	27KΩ	½		BTS-27K	
R26	27KΩ	½		BTS-27K	
R27	150KΩ	½		BTS-150K	
R28	10KΩ	½		BTS-10K	
R29	27KΩ	½		BTS-27K	
R30	1000Ω	½		BTS-1000	
R31	47KΩ	½		BTS-47K	
R32	150KΩ	½		BTS-150K	
R33	100KΩ	½		BTS-100K	
R34	100KΩ	½		BTS-100K	
R35	1000Ω	10		1 3/4A-1000	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	BROOKS PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @.52A	500VAC .080ADC	6.3VAC @5A		19853				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	BROOKS PART No.	MERIT PART No.	
L1	Ant. Impedance matching Coil	0Ω				
L2	Ant. Coil	0Ω				Tapped
L3	Osc. Coil	0Ω	0Ω			
L4	RF Coil	0Ω				
L5	1st. FM IF	.3Ω	.3Ω	16492-2	FM-254	
L6	2nd. FM IF	.3Ω	.3Ω	16492-2	FM-254	
L7	3rd. FM IF	.3Ω	.3Ω	14692-2	FM-254	
L8	4th. FM IF	.3Ω	.3Ω	14692-2	FM-254	
L9	Discriminator	.4Ω	.4ΩCT	15291	FM-253	

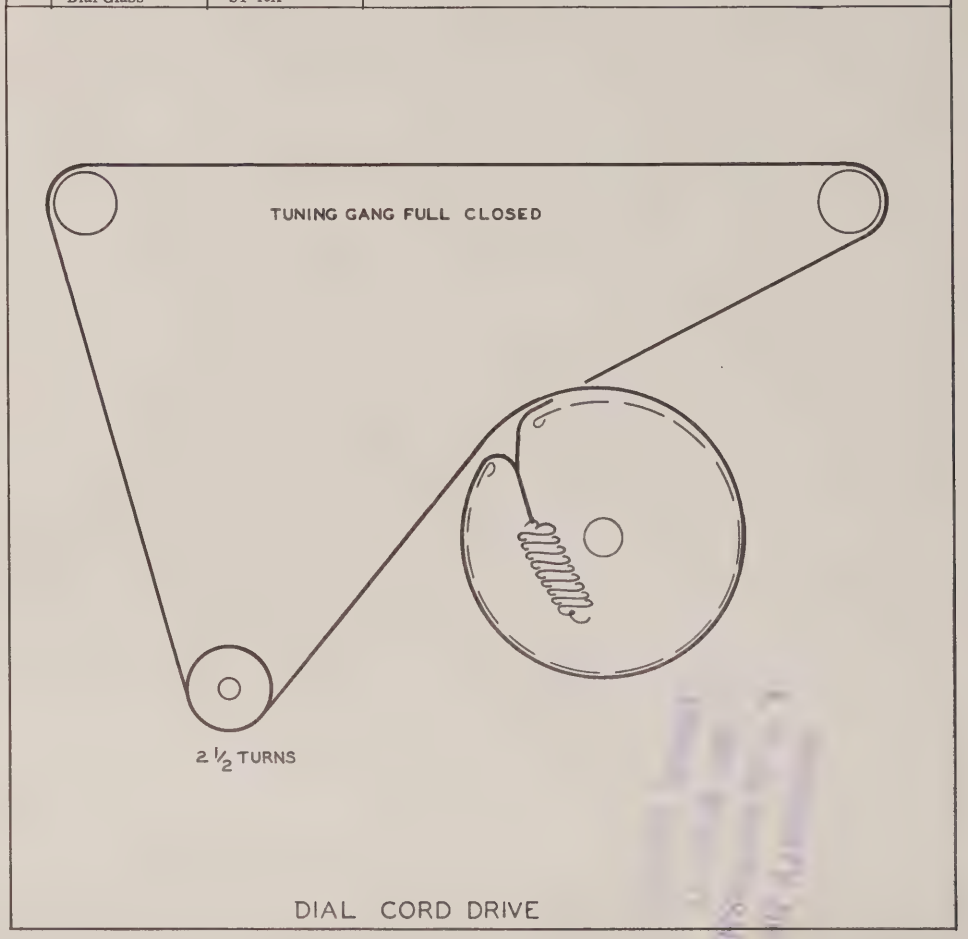
PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

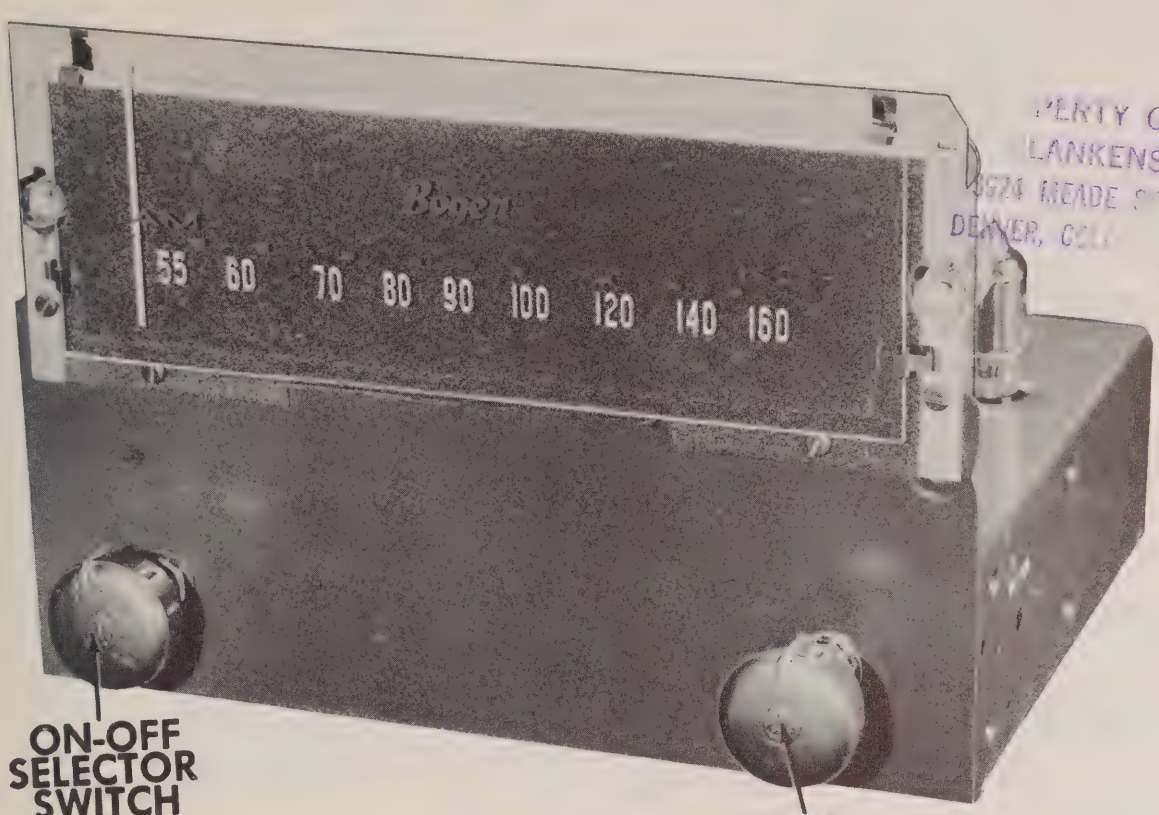
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					BROOKS PART No.		
M1	Bayonet	7.5	.2	White			Type #51
M2	Bayonet	7.5	.2	White			Type #51

MISCELLANEOUS

ITEM No.	PART NAME	BROOKS PART No.	NOTES
M3	Tuning Unit Dial Glass	ST-10A	



DAVID BOGEN
MODEL AM901



PERTY OF
LANKENSHIP
6674 MEADE ST
DENVER, COLO.

DAVID BOGEN
MODEL AM901

TRADE NAME	David Bogen Model AM 901
MANUFACTURER	David Bogen Co., Inc., 663 Broadway, New York, New York
TYPE SET	AC Operated AM Superheterodyne Receiver for Custom Installation
TUBES (Five)	6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 12AU7 or 12AT7 Det.-AVC-AF Amp., 6X4 Rect.
POWER SUPPLY	110-120 Volts AC-60 Cycle
TUNING RANGE—BROADCAST	535-1650 KC
RATING	.16 Amp. @ 117 Volts AC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Connect tuner output to an audio amplifier during alignment.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Volume control should be at maximum position. Output of signal generator should be no higher then necessary to obtain an output reading. Use an insulated aligment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to Pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400Ω Mod)	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output.
2.	200MMF	High side to antenna terminal. Low side to chassis.	600KC	600KC	"	A5, A6 A7	Adjust in order given for maximum output.
3.	"	"	1500KC	1500KC	"	A8, A9, A10	Adjust in order given for maximum output. Repeat Steps 2 and 3 for optimum results.

If interference whistle is noted between two adjacent stations adjust 10KC filter slug, A11, to minimize interference.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

DAVID BOGEN
MODEL AM901

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		David Bogen PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4A	Det. -AVC-AF Amp.	12AU7	12AU7	9A	
B	Det. -AVC-AF Amp.	12AT7	12AT7	9A	
V5	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	♦20	450		AFH2-69		B050		FP237	TVL-4760	
B	♦20	450								
C2	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C3	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C4	47			SI47	D6-470	5R5Q5	GP1K-470	UC-5447	5GA-Q47	
C5	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C6	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C7	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C8	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C9A	100			SI100	♦PC-50	TM5T1	♦1403-01	UC-531	♦100C1	
B	100			SI100		TM5T1		UC-531		
C10	.01	600		P688-01	D6-103	PTE6S1	GPs-333-103	PT611	6TM-S1	
C11	.03	400		P488-03		PTE4S3		PT413	4TM-S3	
C12	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C13	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C14	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C15	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C16	.047	400		P488-047		PTE4S47		PT4147	4TM-S47	

♦ Items C9A, C9B, R9 are combined in one unit.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R1	100KΩ	1/2		BTS-100K	
R2	100KΩ	1/2		BTS-100K	
R3	100KΩ	1/2		BTS-100K	
R4	1000Ω	1/2		BTS-1000	
R5	22KΩ	1/2		BTS-22K	
R6	1000Ω	1/2		BTS-1000	
R7	100Ω	1/2		BTS-100	Note.
R8	3, 3Meg	1/2		BTS-3, 3Meg	
R9	47KΩ	1/2		BTS-47K	

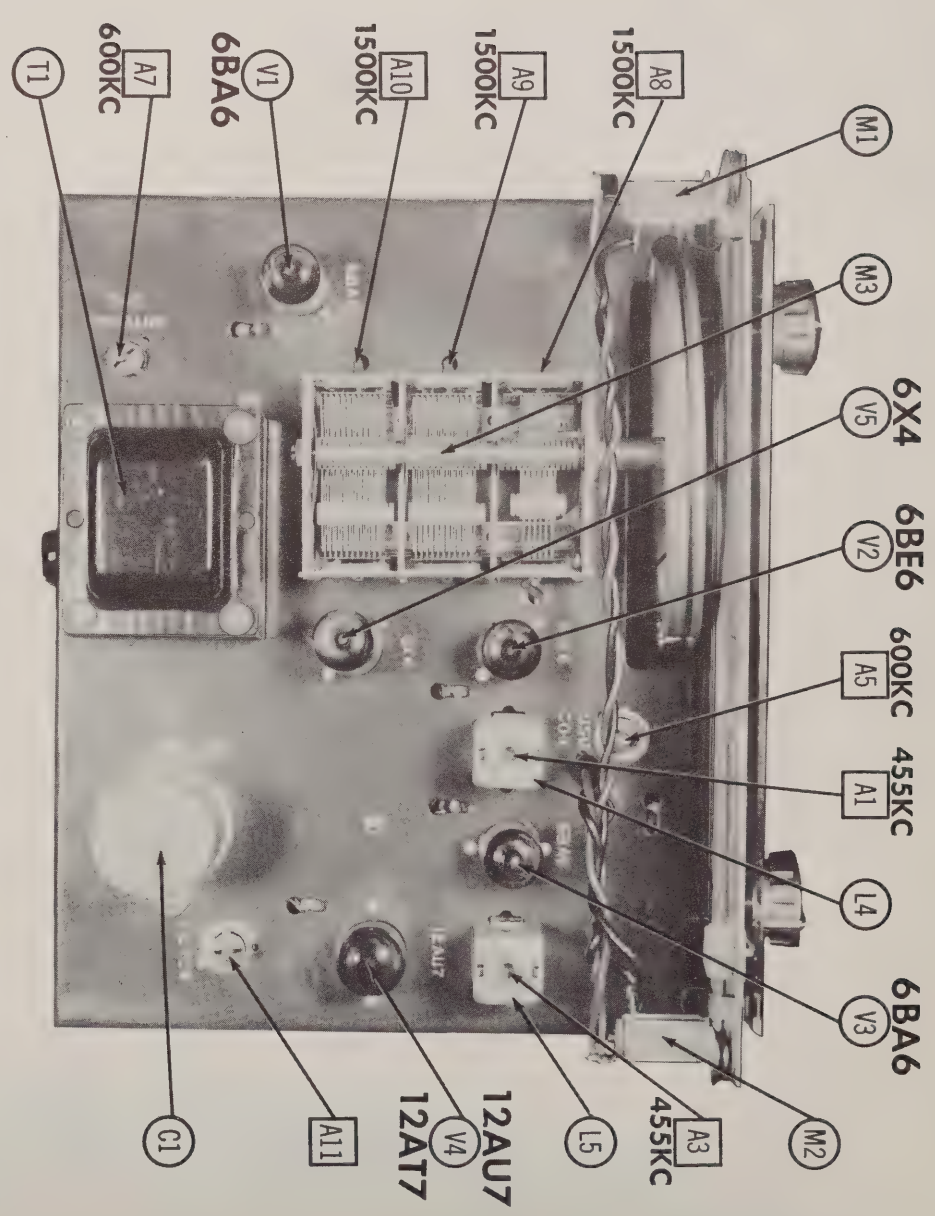
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R10	470KΩ	1/2		BTS-470K	
R11	470KΩ	1/2		BTS-470K	
R12	1000Ω	1/2		BTS-1000	
R13	10KΩ	1/2		BTS-10K	
R14	3300Ω	1/2		BTS-3300	
R15	100KΩ	1/2		BTS-100K	
R16	2500Ω	7	R-2527	1-3/4A-2500	

NOTE: Some models use a 47Ω resistor in this application.
♦ Items R9, C9A, C9B are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117V @ .16A	300Vet .007A	6.3V @ 2.1A		T373				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L1	Ant. Coil	34Ω	2.8Ω	U-304		Tapped @ .2Ω
L2	RF Coil	75Ω	3Ω	U-301		
L3	Osc. Coil	2.2Ω		U-303		Tapped @ 2Ω.
L4	Input IF	18Ω	18Ω	H-368		
L5	Output IF	18Ω	18Ω	H-368		

10KC FILTER CHOKE

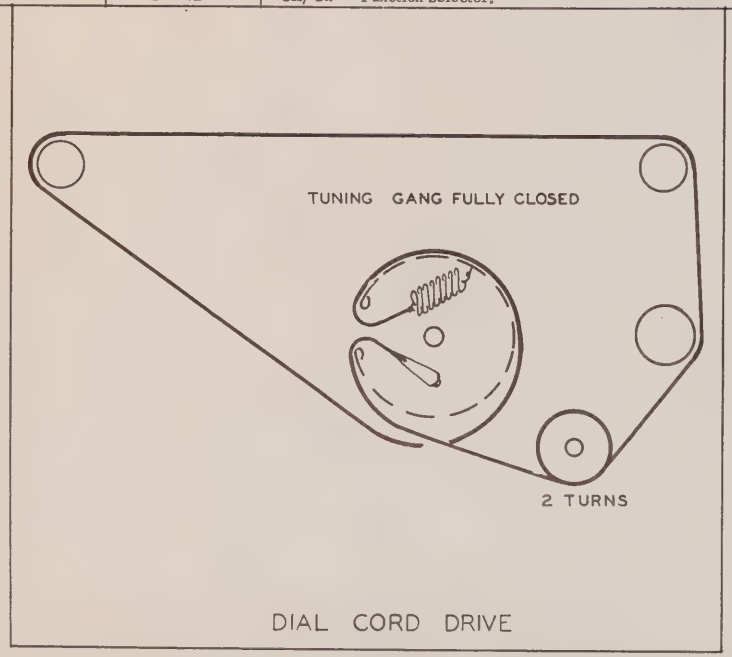
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L6	10KC Filter	124Ω		U-201		

DIAL LIGHTS

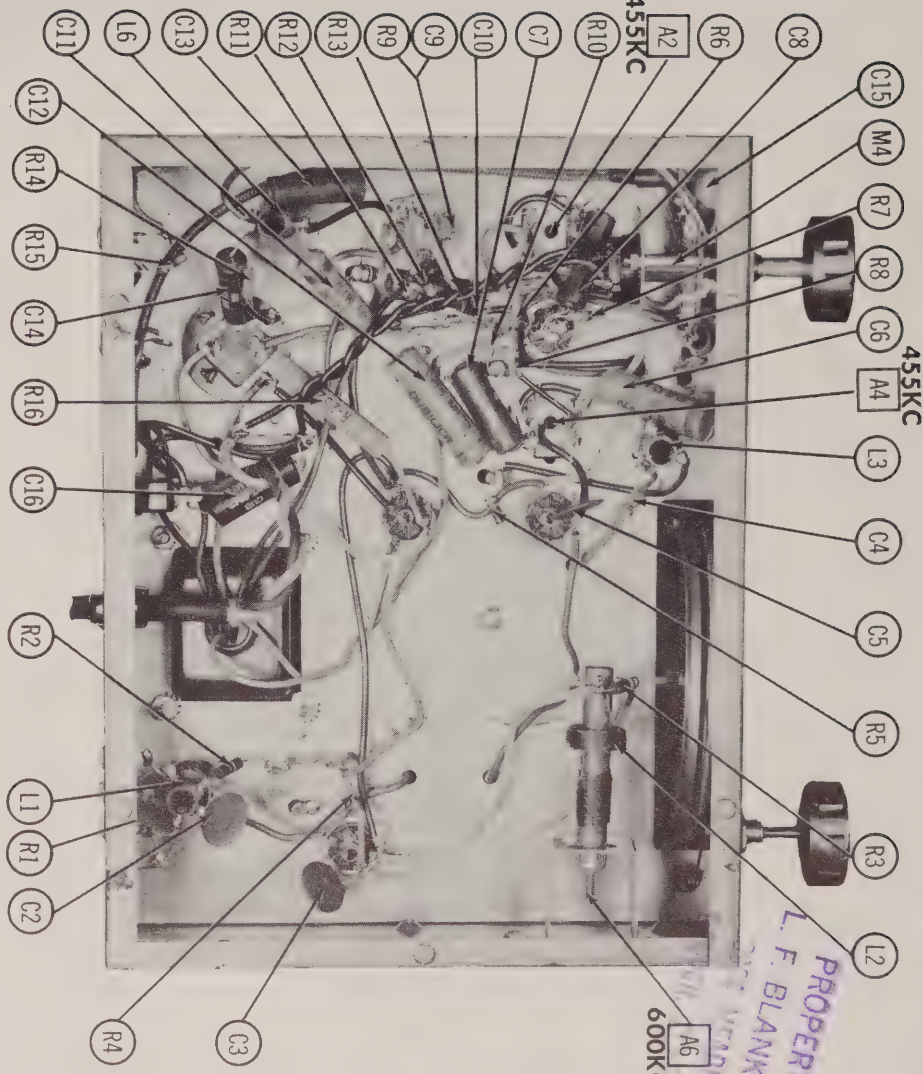
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA David Bogen PART No.	REPLACEMENT DATA	NOTES
M1	Bayonet	7.5	.2	White			Type No. 51
M2	Bayonet	7.5	.2	White			Type No. 51

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M3	Tuning Capacitor	C-622	30-498 MMF, 30-498 MMF, 36-203 MMF.
M4	Switch	S-372B	"Off/On" - Function Selector.

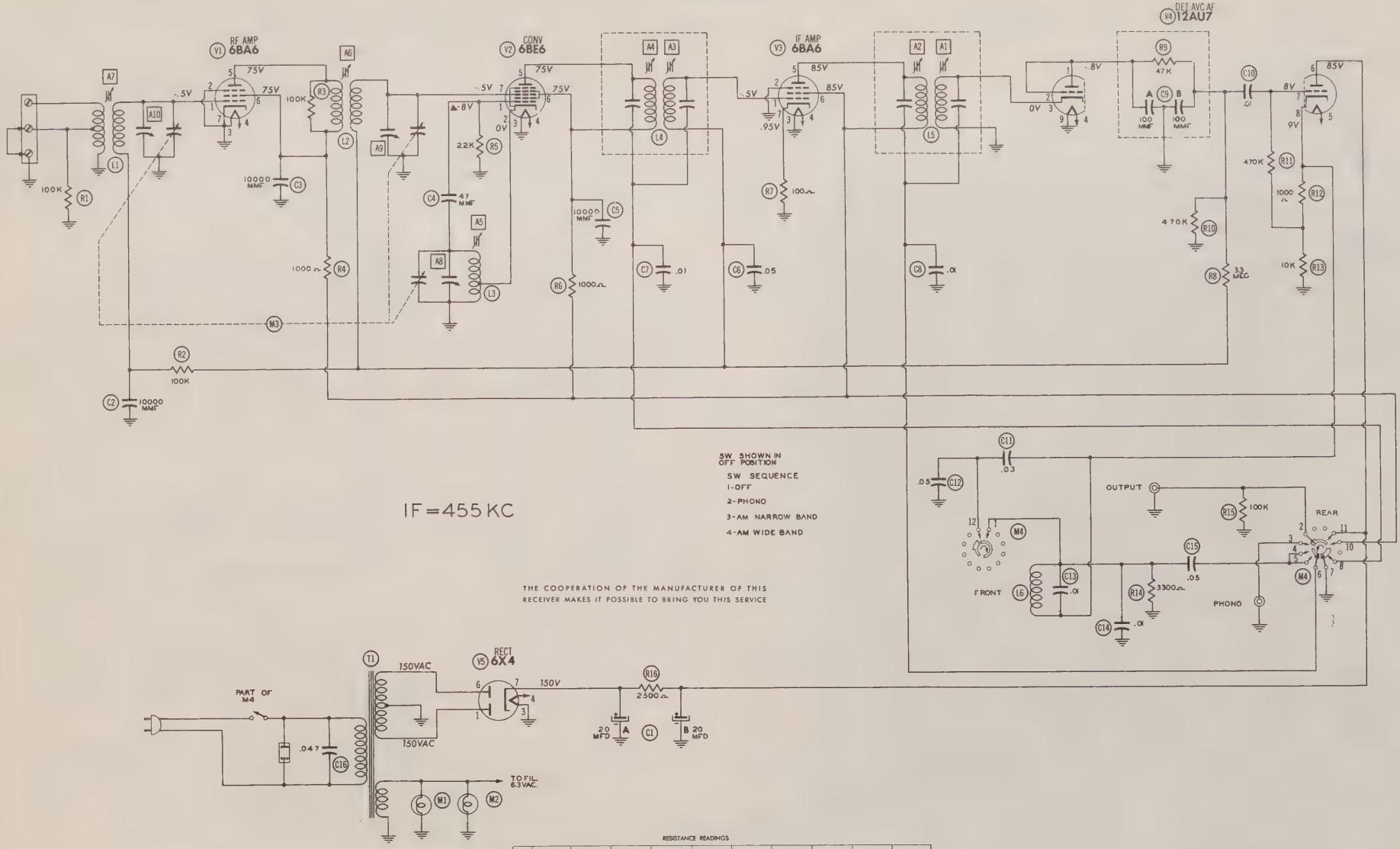


CHASSIS—BOTTOM VIEW



PROPERTY OF
L. F. BLANKENSHIP

DAVID BOGEN
MODEL AM901



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	3.9Meg	0Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 2	6BE6	22KΩ	2Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	3.8Meg		
V 3	6BA6	3.8Meg	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	100Ω		
V 4	12AU7	517KΩ	517KΩ	18Ω	.1Ω	.1Ω	†2.5KΩ	480KΩ	11KΩ	0Ω
V 5	6X4	138Ω	INF	0Ω	.1Ω	INF	144Ω	2Meg		

▲ TAKEN WITH VACUUM TUBE VOLTMETER.
† MEASURED FROM PIN 7 OF V5.
MEASUREMENTS TAKEN IN "AM-WIDE BAND" POSITION.

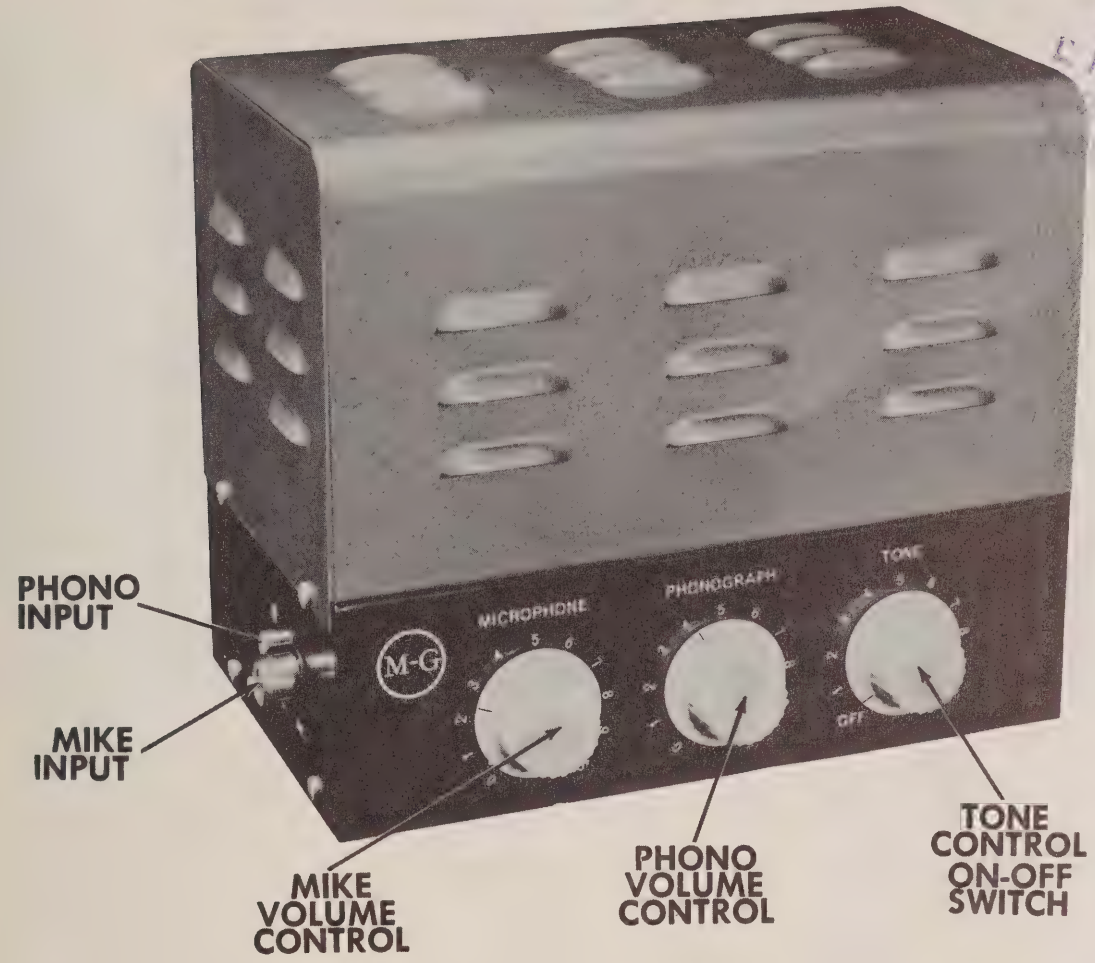
A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1953

195-6

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DON MC GOHAN
MODEL MG-7



DON MC GOHAN
MODEL MG-7

TRADE NAME	Don McGohan Model MG-7
MANUFACTURER	Don McGohan, Incorporated, 3700 W. Roosevelt Rd., Chicago 24, Ill.
TYPE SET	AC Operated 2 Channel Audio Amplifier
TUBES (Three)	Types 6SC7 Pre-Amp., 6L6G Audio Output, 5Y3GT Rect.
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .54 Amp.@ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

DON MC GOHAN
MODEL MG-7

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		Don McGohan PART No.	STANDARD REPLACEMENT		
V1	Pre-Amplifier	6SC7	6SC7	8S	
V2	Audio Output	6L6G	6L6G	7S	
V3	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Don McGohan PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲30	450		AFH4-69		D055		FP444.8	TVL-4732	
B	■20	450								
C	▲20	450								
D	20	25								
C2	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S5	
C3	.02	600		P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C4	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C5	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C6	.02	600		P688-02	DF-203	PTE6S2		PT612	6TM-S2	

CONTROLS

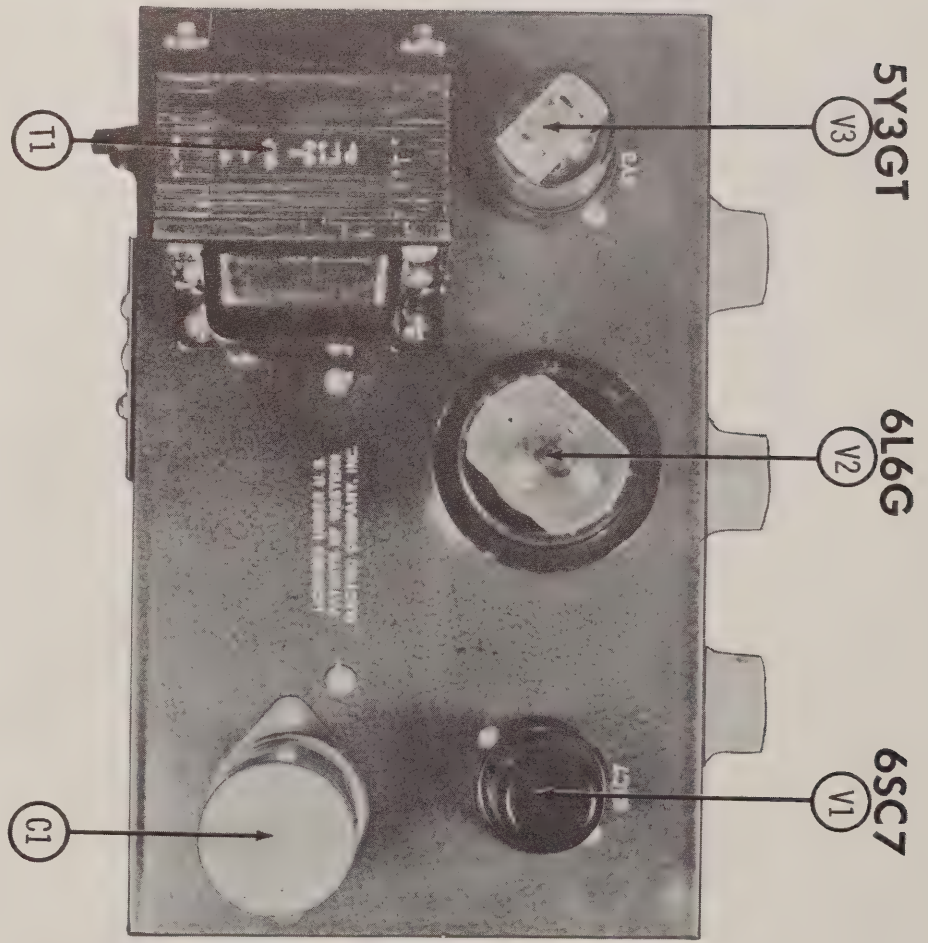
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Don McGohan PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	BA011-301	Q13-133	AG-60-Z	B-60	U-48	Mike Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A.
R2A	500KΩ	½	BA011-301	Q13-133	AG-60-Z	B-60	U-48	Phono Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A.
R3A	500KΩ	½	BA012-131	Q13-133	AG-60-Z	B-60-S	U-48	Tone
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R3A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R3A.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Don McGohan PART No.	IRC PART No.	
R4	10Meg	½		BTS-10Meg	
R5	500KΩ	½			
R6	100KΩ	½		BTS-100K	
R7	500KΩ	½			
R8	10Meg	½		BTS-10Meg	
R9	500KΩ	½			

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Don McGohan PART No.	IRC PART No.	
R10	4.7Meg	½		BTS-4.7Meg	
R11	470KΩ	½		BTS-470K	
R12	250Ω	5		1-3/4A-250	
R13	250Ω	5		1-3/4A-250	
R14	10KΩ	2		BTB-10K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

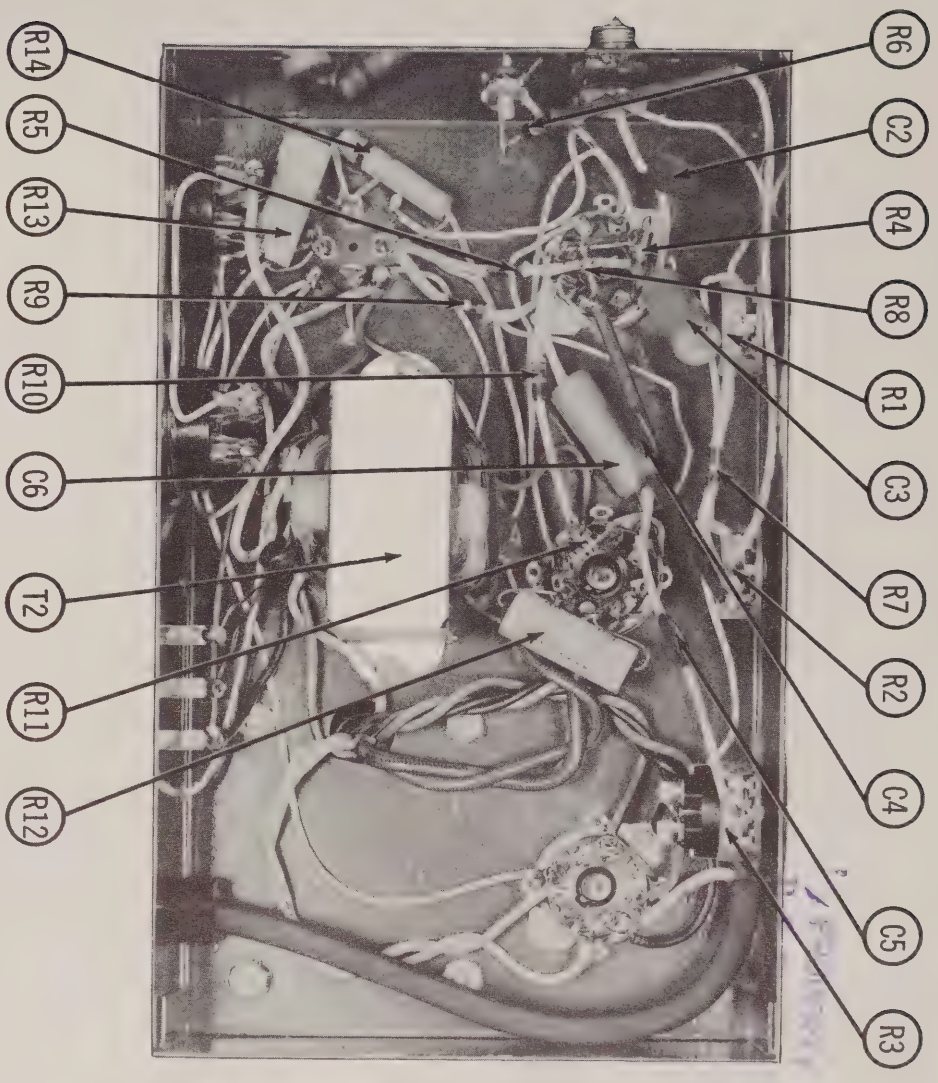
ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	Don McGohan PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .54A	650VCT .069ADC	5VAC @ 2A	6.3VAC @ 1.5A		PC-8408 ①	P-3151 ①	PV-70 ①	R-11A ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

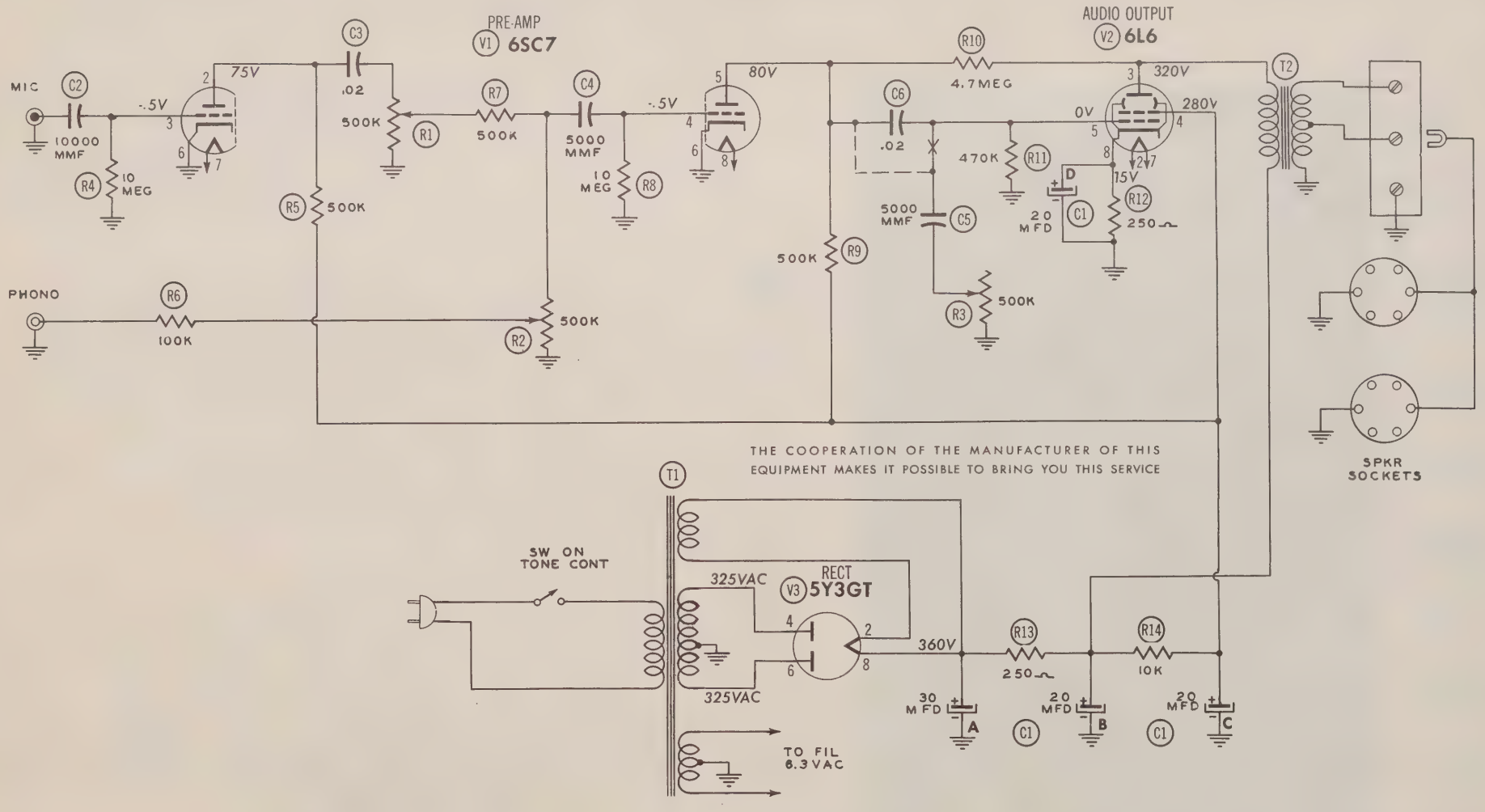
ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		Don McGohan PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	3.8KΩ	8Ω tap @ 4Ω	495Ω	.86Ω tap @ .6Ω		A3825		RO-401 ①	S-29X ①	① Drill one new mounting hole.

CHASSIS—BOTTOM VIEW



DON MC GOHAN MODEL MG-7

DON MC GOHAN MODEL MG-7



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0Ω	† 500KΩ	10Meg	10Meg	† 500KΩ	0Ω	.1Ω	.1Ω
V 2	6L6G	0Ω	.1Ω	† 745Ω	† 10KΩ	470KΩ	INF	.1Ω	250Ω
V 3	5Y3GT	INF	180KΩ	INF	162Ω	INF	178Ω	INF	180KΩ

† MEASURED FROM PIN 2 OF V3.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1953

195-7

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

PHOTOFACT* Folder

HOFFMAN MODELS 21B116, 21B309, 21B701, 21M115, 21M308, 21M700, 21P310, 21P702 (Ch. 196, M, T)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 21M115

HOFFMAN MODELS 21B116, 21B309, 21B701, 21M115, 21M308, 21M700, 21P310, 21P702 (Ch. 196, M, T)

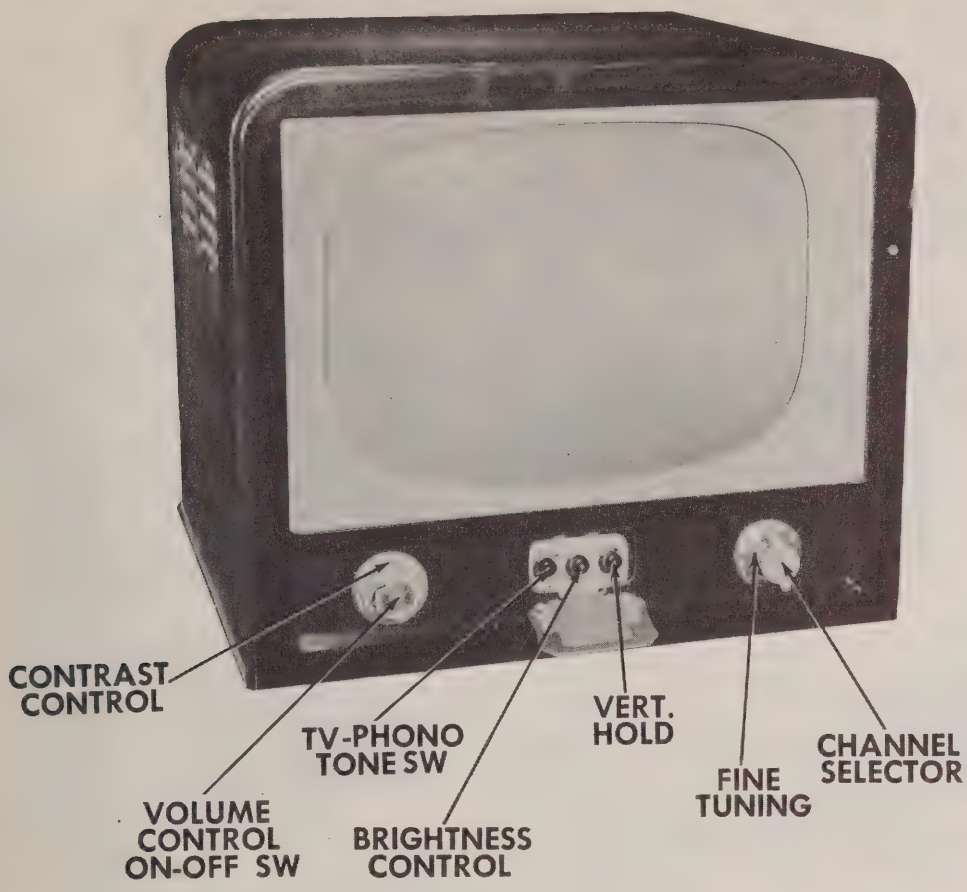
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2–53 SET 195 FOLDER 8

PHOTOFACT* Folder
*TRADE MARK

HOFFMAN MODELS 21B116, 21B309, 21B701, 21M115, 21M308, 21M700, 21P310, 21P702 (Ch. 196, M, T)



HOFFMAN 21M115

TRADE NAME	Hoffman Models 21B116 (Ch. 196, M) 21B309, 21B701 (Ch. 196M, T) 21M115 (Ch. 196, M) 21M308, 21M700, 21P301, 21P702 (Ch. 196M, T)
MANUFACTURER	Hoffman Radio Corp., 3761 S. Hill. St., Los Angeles, California
TYPE SET	Television Receiver
TUBES	Twenty Four
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.95 Amp @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25 (Intercarrier)

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 13 thru 16
Photographs
- Cabinet - Rear View 11
- Capacitor and Alignment Identification 4, 9
- Chassis - Top View 3
- RF Tuner 10

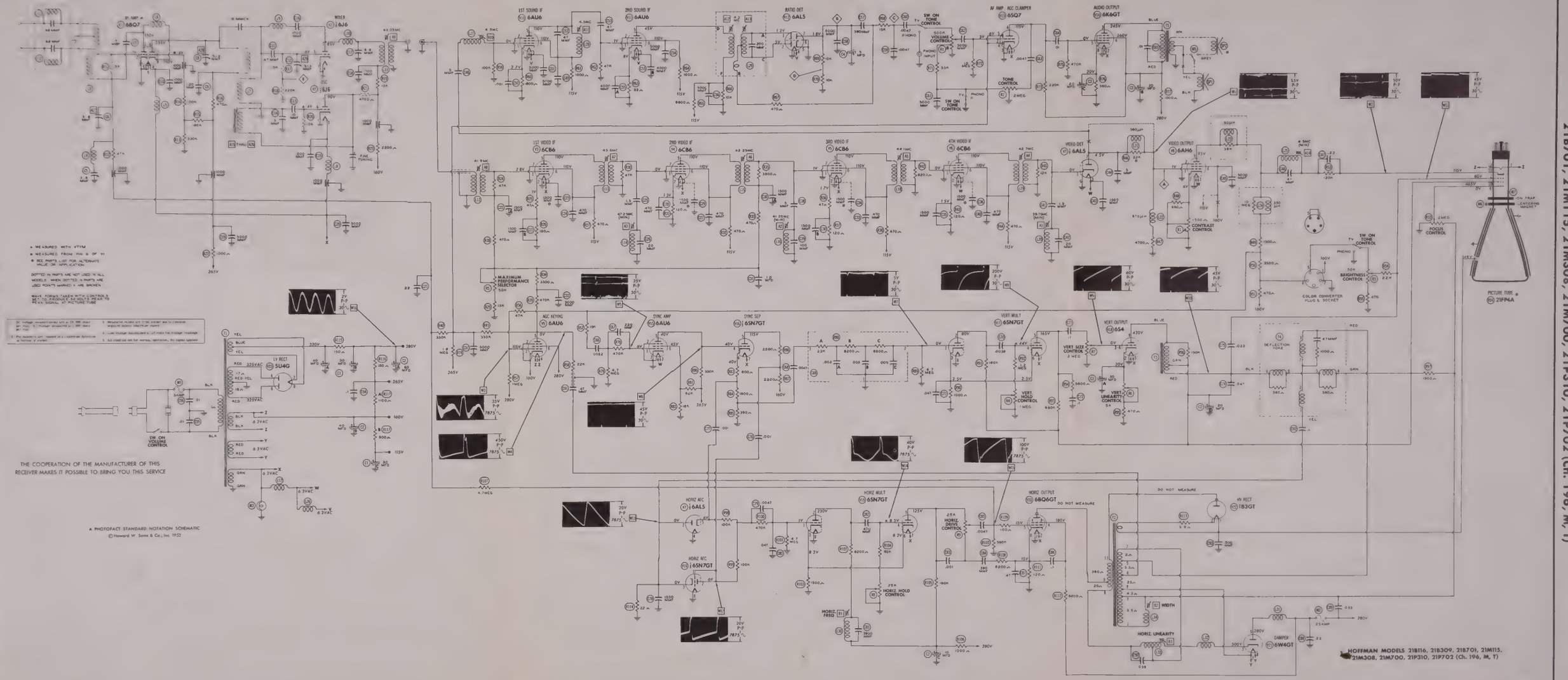
Photographs (Cont)
- Resistor and Inductor Identification 12, 17

Resistance Measurements 8
Schematic 2
Servicing in the Field 18
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

HOFFMAN MODELS 21B116, 21B309, 21B701, 21M115, 21M308, 21M700, 21P310, 21P702 (Ch. 196, M, T)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


HOFFMAN MODELS 21B116, 21B309, 21B701, 21M115, 21M308, 21M700, 21P310, 21P702 (Ch. 196, M, T)
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1953
1ST SOUND IF V10 6AU6
2ND SOUND IF V11 6AU6
RATIO DET V12 6AL5
AF AMP ACC CLAMPER V13 6SQ7
AUDIO OUTPUT V14 6K6GT
1ST VIDEO IF V17 6CB6
2ND VIDEO IF V16 6CB6
3RD VIDEO IF V15 6CB6
4TH VIDEO IF V5 6CB6
VIDEO DET V7 6AL5
VIDEO OUTPUT V8 6AH6
AGC KEYING V9 6AU6
SYNC AMP V13 6AU6
SYNC SEP V10 6SN7GT
VERT MULT V11 6SN7GT
VERT OUTPUT V12 6S4
HORIZ AFC V7 6AL5
HORIZ AFC V13 6SN7GT
HORIZ MULT V13 6SN7GT
HORIZ OUTPUT V10 6BQ6GT
HV RECT V12 1B3GT
DAMPER V11 6W4GT
LV RECT V14 5U4G
SW ON VOLUME CONTROL
SW ON TONE CONTROL
MAXIMUM PERFORMANCE SELECTOR
VOLUME CONTROL
TONE CONTROL
CONTRAST CONTROL
BRIGHTNESS CONTROL
COLOR CONVERTER PLUG & SOCKET
PICTURE TUBE V24 21FP4A
ION TRAP CENTERING MAGNET
FOCUS CONTROL
VERT SIZE CONTROL
VERT LINEARITY CONTROL
VERT HOLD CONTROL
HORIZ DRIVE CONTROL
HORIZ HOLD CONTROL
HORIZ FREQ
WIDTH
HORIZ LINEARITY
DEFLECTION YOKE
FINE TUNING
DO NOT MEASURE
A MEASURED WITH VTVM
B MEASURED FROM PIN 8 OF V1
C SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED A PARTS ARE USED POINTS MARKED X ARE BROKEN.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE SQUARE WAVE TO PEAK SIGNAL AT PICTURE TUBE
1. Voltage measurements are to 300 ohm per volt. 2. Voltage measured on 1000 ohm per volt. 3. Measured values are those which may be obtained using electron voltmeter. 4. Line voltage fluctuations will cause the voltage readings to vary. 5. All controls set for normal operation. No signal applied.

PRINTED COPY
L. F. BLANKENSHIP
3924 KOLBE ST
DENVER, 2

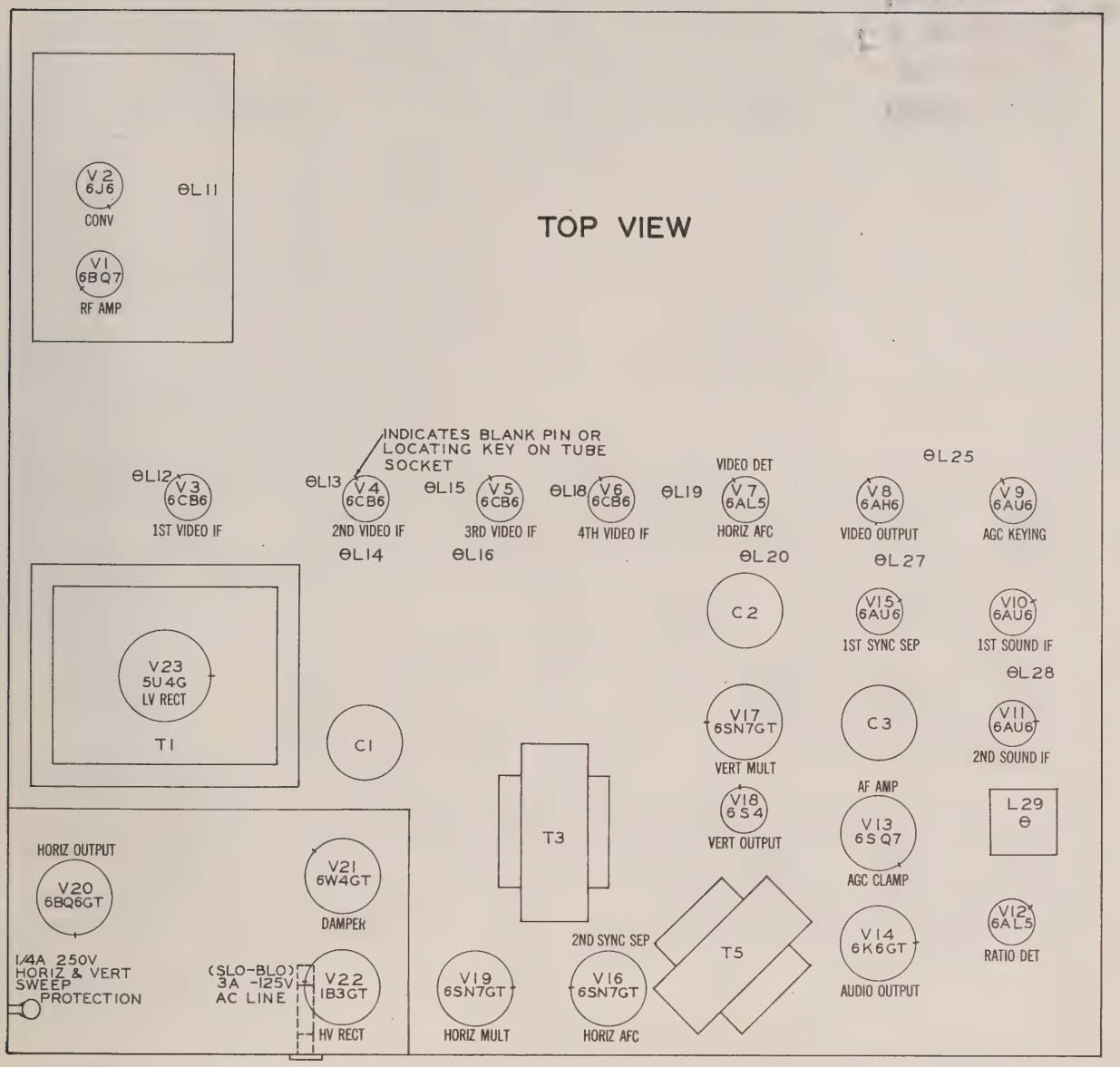
CHASSIS TOP VIEW

PROPERTY OF
L. F. D[illegible]SHIP
[illegible] MEAD ST.
DENVER, COLORADO

CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION

HOFFMAN MODELS 21B116, 21B309, 21B701, 21M115, 21M308, 21M700, 21P310, 21P702 (Ch. 196, M, T)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V23 Fuse M1

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6, V7
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V8, V24
Has pic, no sound-V10, V11, V12, V13, V14
Overloaded picture-V9, V13

SYNC FAILURE
No vert. sync.-V16, V17
No horiz. sync.-V7, V16, V19
No vert. or horiz. sync.- V15, V16

SWEEP FAILURE
No raster, has sound-V19, V20, V21, V22, V24 Fuse(M2)
No vertical deflection -V17, V18
Poor vert. linearity or foldover-V17, V18
Poor horiz. linearity or foldover-V19, V20, V21
Narrow picture-V19, V20, V21, V22
Vert. off freq.-V16, V17
Horiz. off freq.-V7, V16, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube (V19).

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C31. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	39.75MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	41.25MC	"	"	A2	"
3.	"	"	47.25MC	"	"	A3	"
4.	"	"	42.7MC	"	"	A4	Adjust for maximum deflection.
5.	"	"	44.1MC	"	"	A5	"
6.	"	"	42.25MC	"	"	A6	"
7.	"	"	45.6MC	"	"	A7	"
8.	"	"	41.9MC	"	"	A8, A9	Adjust A9 counter clockwise for MINIMUM at 41.9MC. Adjust A8 for maximum deflection. If A8 and A9 are both near maximum response at 41.9MC oscillations may occur preventing proper setting of A8.
9.	"	"	45.05MC	"	"	A9	Adjust for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (10MC Swp.)	39.75MC 42.25MC 45.6MC 45.75MC 47.25MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary retouch A4 thru A9 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
12.	"	"	"	"	DC probe to point (C) Common to point (D)	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.001MFD	High side to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A10, A11, A12	Disconnect stabilizer capacitor, C4. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
12.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A13	Reconnect capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Turn contrast control to maximum contrast.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	.001MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig. 4) to pin 11 of picture tube. Common to chassis.	A14	Temporarily detune L27 by touching terminal with screw driver shaft held in the fingers, while at the same time adjusting A14, for MINIMUM deflection on VTVM.

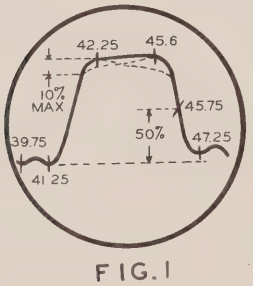


FIG. 1

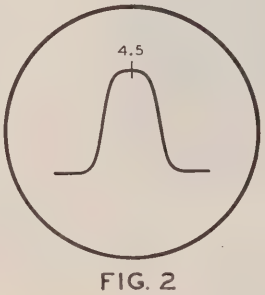


FIG. 2

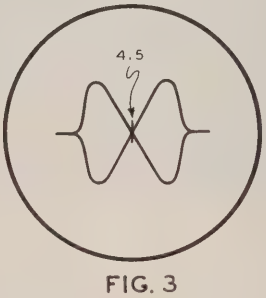


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the bias battery as under Video IF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp to point (A) Low side to chassis.	A15	Adjust to place sound marker in sound trap notch as in Fig. 5. Video marker should be at 50% response.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A16	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A18	
			189MC (10 MC Swp)	187.25 MC 191.75MC	9		A19	
			183MC (10MC Swp)	181.25MC 185.25MC	8		A20	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A21	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A22	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A23	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A24	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A25	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A26	

RF ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. to point (E) . Low side to chassis.	A27, A28 A29	Adjust for maximum response similar to Fig. 6.
16.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel make compromise adjustments of A27, A28 and A29 with channel switch set to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

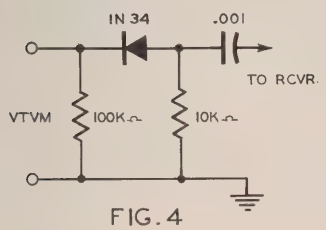


FIG. 4

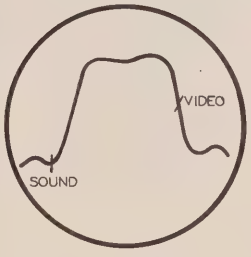


FIG. 5

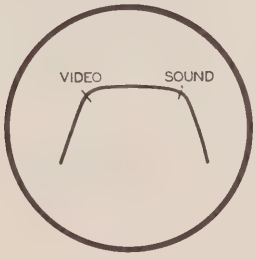
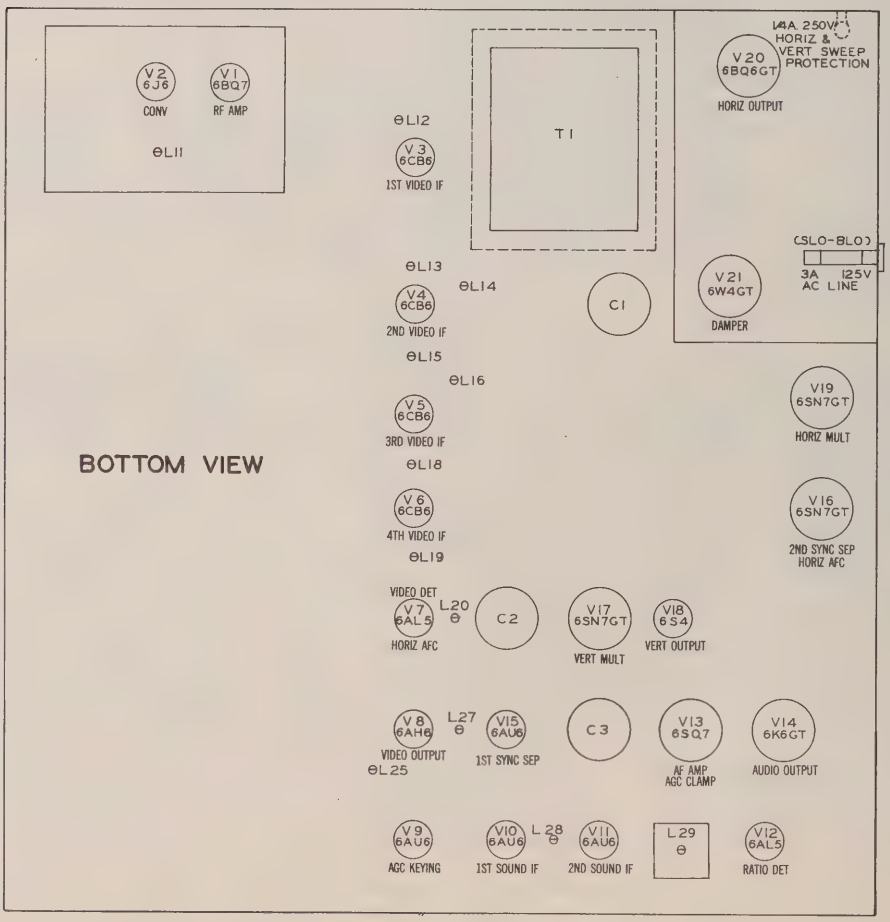


FIG. 6

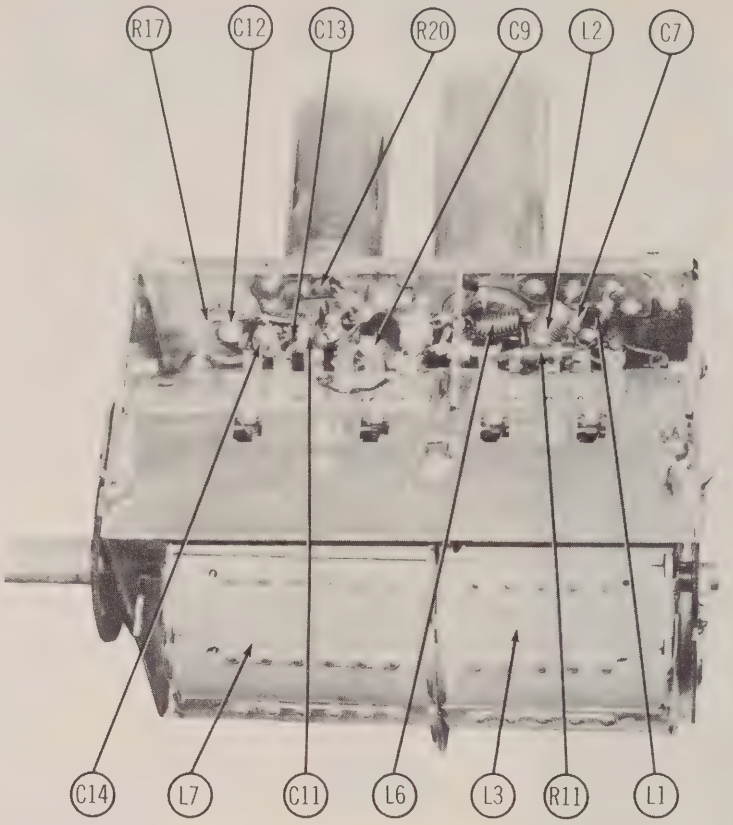
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	1.4Meg	0Ω	.1Ω	0Ω	†2KΩ	†192KΩ	INF	0Ω
V 2	6J6	†8.3KΩ	†18.6KΩ	.1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 3	6CB6	60KΩ	167Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 4	6CB6	.2Ω	120Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 5	6CB6	60KΩ	167Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 6	6CB6	.2Ω	120Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 7	6AL5	.2Ω	22Ω	.1Ω	0Ω	5.2Meg	0Ω	4.7KΩ		
V 8	6AH6	4.7KΩ	0Ω	.1Ω	0Ω	†6.7KΩ	†1.4KΩ	40Ω		
V 9	6AU6	†52KΩ	†1.4KΩ	†1.4KΩ	†1.4KΩ	390KΩ	†150Ω	†1.4KΩ		
V 10	6AU6	100KΩ	0Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	1.8KΩ		
V 11	6AU6	47KΩ	0Ω	.1Ω	0Ω	†7.7KΩ	†3.2KΩ	82Ω		
V 12	6AL5	INF	INF	0Ω	.1Ω	0Ω	0Ω	20KΩ		
V 13	6SQ7	0Ω	10 Meg	0Ω	530KΩ	530KΩ	†221KΩ	.1Ω	0Ω	
V 14	6K6GT	INF	.1Ω	†1.6KΩ	†1.1KΩ	470KΩ	INF	0Ω	560Ω	
V 15	6AU6	5.2Meg	0Ω	.1Ω	0Ω	†330KΩ	†23KΩ	0Ω		
V 16	6SN7GT	5.2Meg	5.2Meg	22Ω	†330KΩ	†5.8KΩ	4KΩ	.1Ω	0Ω	
V 17	6SN7GT	4.7Meg	#181KΩ	1KΩ	1.3Meg	#681KΩ	1KΩ	.1Ω	0Ω	
V 18	6S4	INF	1KΩ	1.1Meg	0Ω	.1Ω	1.1Meg	INF	INF	#3.1KΩ
V 19	6SN7GT	4.7Meg	†9.4KΩ	1.5KΩ	100KΩ	†181KΩ	1.5KΩ	.1Ω	0Ω	
V 20	6BQ6GT	120Ω	.1Ω	560KΩ	†6.9KΩ	560KΩ	555KΩ	0Ω	120Ω	Top Cap #25Ω
V 21	6W4GT	1.6Meg	412KΩ	1.6Meg	INF	†150Ω	INF	#33Ω	#33Ω	
V 22	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #415Ω
V 23	5U4G	INF	13.5KΩ	INF	17Ω	INF	16Ω	INF	13.5KΩ	
V 24	21FP4A	†1.4KΩ	45KΩ	Pin 6 2.8Ω	Pin 10 #1.5KΩ	Pin 11 †127KΩ	Pin 12 †1.4KΩ			

† MEASURED FROM PIN 2 OF V23
# MEASURED FROM PIN 3 OF V21

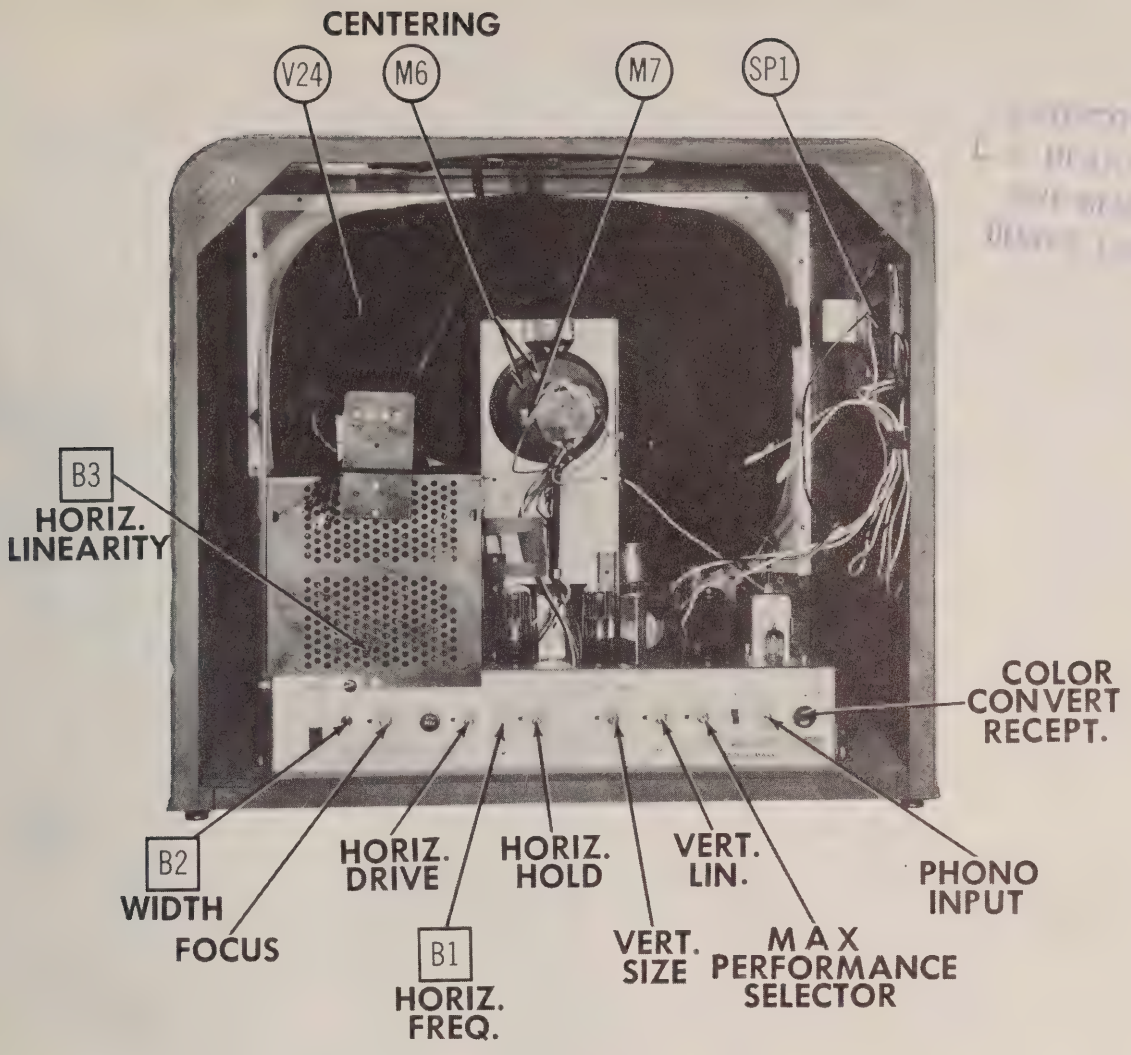


TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE

RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold control for horizontal synchronization without bending of vertical lines near the top of the picture.

If unable to obtain satisfactory horizontal synchronization by means of the horizontal hold control adjust the horizontal frequency slug (B1).

Turn B1 counter clockwise while turning the channel selector on and off channel until sync is lost. Turn B1 clockwise and note the number of diagonal bars just before sync pull in.

There should be not less than 2 bars.

Continue turning B1 until sync is lost again, then turn B1 counter clockwise and note the point where sync pull in occurs.

Turn B1 an additional $\frac{1}{2}$ turn counter clockwise.

Adjust the horizontal drive control counter clockwise as far as possible without the presence of a vertical white bar in the picture.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. ANKENBRANDT
3010 WADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA Hoffman PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6BQ7	6BQ7	9AJ	
B	RF Amplifier	6BK7	6BK7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector- Horiz. AFC	6AL5	6AL5	6BT	
V8	Video Output	6AH6	6AH6	7BK	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V11	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier- AGC Clamper	6SQ7	6SQ7	8Q	
V14	Audio Output	6K6GT	6K6GT	7S	
V15	1st. Sync Separator	6AU6	6AU6	7BK	
V16	2nd. Sync Separator- Horiz. AFC	6SN7GT	6SN7GT	8BD	
V17	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V18	Vert. Output	6S4	6S4	9AC	
V19	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA Hoffman PART No.	SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V24A	21FP4A	21FP4A		12C	① Circuit changes necessary
B	21MP4			12C	
C	21FP4 ①	21FP4		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Hoffman PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	475	4232	E4C335		CO35		FP262 TC84	TVL-3843	
B	▲30	475								
C	■30	475								
C2A	■60	350	4247	AFH3-29		CO23		FP391.1	TVL-3640	
B	▲40	350		PRS500/16		BR2050A		TC78	TVA-1804	
C	10	350								
D	▲20	475								
C3A	▲50	50	4230	AFH3-157		BO64		FP230	TVL-3801	
B	■20	475		PRS25/10		BR505		TC26		
C	20	25								
C4	5	50	4209	PRS150/4		BR550		TC30	TVA-1303	
C5	3-8				829-10					
C6	3-8				829-10					
C7	3									
C8	.5-3				829-3			CT-565A		
C9	120			SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C10	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C11	47			BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C12	.5-3				829-3			CT565A		
C13	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C14	5			SI5N750	TCN-5		N750K-050	NT-555	5TCUB-V5	
C15	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C16	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C17	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C18	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C19	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C20	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C21	.22	200	4131	P488-22		PTE4P22		PT4025	2TM-P22	
C22A	1500		14029	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C23	1500		14030	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C24	470		14027	BPD-00047	D6-470	TM5T5	GP2K-471	UC-5347	5GA-T47	
C25	1.5		4082	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C26	20			SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C27	470		14027	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C28	470		14027	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C29	1500		14030	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C30A	1500		14029	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C31	1.0	100	14200	484-1.0				PT41	2TM-M1	
C32	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	470		14027	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C34	1500		14030	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C35	1500		14030	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C36	1500		14030	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C37	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C38	5		4081	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C39	100	500		1469-0001		5R5T1		MCB235	MS-31	
C40	470		14027	BPD-00047	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C41	1.5		4082	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C42	20	500		1469-00002		5R5Q2			MS-42	
C43	1500		14029	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C44	5		4081	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C45	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C46	47			SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C47	.22	200	4131	P488-22		PTE4P22		PT4025	2TM-P22	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
			REPLACEMENT DATA							
C48	5		4081	815N9D	TCZ-4.7		NP0K-050	Z7-555	5TCCB-V47	
C49	5000		4039	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C50	.001	400	4174	P688-001	D6-102	P688-001	GP2L-102	PT621	6TM-D1	
C51	5000		4039	BPD-005	DD- 502	TMSD5	811-005	DC-525	5HK-D5	
C53	4T			8147	D6-470	TMSQ5	GP1K-470	UC-5447	5GA-Q47	
C53	4T		14005	8147	D6-470	TMSQ5	GP1K-470	UC-5447	5GA-Q47	
C54	5000		4039	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C55A	4000		4036	BPD-3X004	D8-403	TM5DD4	822-004	DCD-524	5HK-2D4	
B	4000				D8-402					
C56	5000		4039	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C57	390	500	14010	1469-0004			5R5T4	MCB243	MS-34	
C58	5000		4039	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C59	.0047	400	4127	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C60	.0047	400	4127	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C61	5000		4039	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C62	5000		4039	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C63	.0047	600	4128	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C64	.01	600	4105	P688-001	D6-103	PTE6D1	GP2-333-103	PT611	6TM-S1	
C65	.01	600	4105	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C66	.0022	400	4126	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C67	220		4026	S1220	D6-221		GP3K-221	UC-5332	5GA-T22	
C68	.0047	400	4127	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C69A	.005		P688-002			PTE6D2		PT622		
B	.005		P688-005	●PC-9695	●PC-100	PTE6D5	●1405-01	PT625	●101C1	
C	.005		P688-005			PTE6D5		PT625		
C70	.0039	600	14113	1464-004		IDR5D4		MCB463	MS-24	
C71	.047	200	4138	P688-047	DF-503	PTE4S47		PT6147	6TM-S47	
C72	.1	600	14133	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C73	.1	600	4144	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C74	.047	600	4133	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C75	.022	600	4124	P688-022	DF-203	PTE6S22		PT6122	6TM-S22	
C76	.001	400	4175	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C77	.001	400	4175	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C78	1500		14020	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C79	.0047	400	4127	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C80	.047	200	4147	P688-047	DF-503	PTE4S47		PT6147	6TM-S47	
C81	3900	500	4085	1464-004		IDR5D4		MCB463	MS-24	
C82	470	500	14009	1469-0005		5R5T5		MCB245	MS-35	
C83	.001	400	14104	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C84	390	500	14010	1469-0004		5R5T4		MCB243	MS-34	
C85	.0047	600	4128	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C86	.1	600	4144	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C87	.47	300	4173	P288-47		PT2P5		PT405	2TM-P47	
C88	.22	400	14103	P488-22		PTE4P22		PT4025	4TM-P22	
C89	.033	600	14127	P688-033		PTE6S33		PT6133	6TM-S3	
C90	.039	600	14124							
C91	47	1500	4067					MCL447	15GAB-Q47	
C92	.1	600	14133	P888-1	DF-104	PTE6P1		PT601	6TM-P1	
C93	500	20000	4056	HV20C	TV3-502	MM-C20T5	413-501		20DK-T5	
C94	.1	600	4144	P888-1	DF-104	PTE6P1		PT601	6TM-P1	
C95	.01	600	4105	6892GXY-01		PT6S1		PT611	6TM-S1	
C96	.01	600	4105	6892GXY-01		PT6S1		PT611	6TM-S1	

Note 1. Not used in some Models.
● Items C69A, C89B, C89C, R88A, R88B, R88C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	HOFFMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No	MALLORY PART No.	INSTALLATION NOTES
			REPLACEMENT DATA					
R1A	1500Ω		4879	QJ-412*	RTV-381	SBBT-728-S		Contrast-Panel Volume & Switch Tapped ② 150KΩ - Rear Tone & TV-Phono SW
B	500KΩ						U-35	Brightness
R2	2 Meg		4890					
R3A	50KΩ		4867	Q11-123	AG-44-S	AB-31	U-35	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	1 Meg		4868	Q11-137	AG-61-S	AB-69	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	50KΩ		4853	Q11-123	AG-44-S	AB-31	SU-35	Maximum Performance - Selector (AGC)
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5000Ω		4885	Q11-114	AG-19-S	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	2 Meg		4864	Q11-139	AG-83-S	AB-75	SU-56	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	25KΩ		4859	Q11-120	AG-40-S	AB-26	SU-29	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A
R9A	25KΩ		4859	Q11-120	AG-40-S	AB-E6	SU-29	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R9A
R10A	2 Meg		4864	Q11-139	AG-83-S	AB-75	SU-56	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R10A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS AND SHAFTS B17-109 & P1-208 (Panel) B13-133X & R1-223 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	HOFFMAN PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R11	15KΩ				
R12	47KΩ				
R13	330KΩ				
R14	100KΩ				
R15	180KΩ			BTS-180K	
R16	470Ω			BTS-470	
R17	15KΩ			BTS-15K	
R18	220KΩ			BTS-220K	
R19	15KΩ			BTS-15K	
R20	10KΩ			BTS-10K	
R21	4700Ω			BTS-4700	
R22	1000Ω		4659	BTS-1000	
R23	2200Ω		4512	BTS-2200	
R24	47KΩ-5%		4537		

ITEM No	RATING OHMS	RATING WATT	HOFFMAN PART No.	IRC PART No.	NOTES
			REPLACEMENT DATA		
R25	47Ω		4639		
R26	120Ω		4546	BTS-120	
R27	470Ω		4864	BTS-470	
R28	470Ω		4864	BTS-470	
R29	15K Ω		4521	BTS-15K	
R30	47KΩ-5%		4537	BTS-47K-5%	
R31	120Ω		4546	BTS-120	
R32	470Ω		4864	BTS-470	
R33	470Ω		4864	BTS-470	
R34	3300Ω		4607	BTS-3300	
R35	39000-5%		4614	BTS-3900-5%	
R36	47Ω		4639		
R37	120Ω		4546	BTS-120	
R38	470Ω		4864	BTS-470	

RESISTORS (CONT.)

ITEM No.	RATING OHMS	RATING WATT	Hoffman PART No	IRC PART No.	NOTES
			REPLACEMENT DATA		
R39	470KΩ-5%		34550	BTS-470K-5%	
R40	330KΩ		4677	BTS-330K	
R41	330KΩ-5%		34532	BTS-330K-5%	
R42	8200Ω-5%		4641		
R43	120Ω		4546	BTS-120	
R44	470Ω		4864	BTS-470	
R45	12KΩ-5%		4656		
R46	22KΩ		4501	BTS-22K	Note
R47	4700Ω-5%		4648	BTS-4700-5%	
R48	680Ω		4514	BTS-680	
R49	1500Ω-5%		4610	BTS-1500-5%	
R50	3300Ω-5%		4948	BTS-3300-5%	
R51	470Ω		4656	BTS-470	
R52	15KΩ		4652	BTS-15K	
R53	120KΩ		4648	BTS-120K	
R54	22KΩ		4501	BTS-22K	
R55	47KΩ		4559	BTS-47K	
R56	47KΩ		4504	BTS-47K	
R57	1 Meg		4614	BTS-1 Meg	
R58	22KΩ		4628	BTS-22K	
R59	100KΩ		4511		
R60	1800Ω		4640	BTS-1800	
R61	1000Ω		4543	BTS-1000	
R62	47KΩ		4504		
R63	82Ω		4598	BTS-82	
R64	1000Ω		4542	BTS-1000	
R65	6800Ω	1	4808	BTA-6800	
R66	10KΩ	1	4644	BTA-10K	
R67	470Ω		4638	BTS-470	
R68	15KΩ		4521	BTS-15K	
R69	10KΩ		4597	BTS-10K	
R70	10KΩ		4597	BTS-10K	
R71	33KΩ		34627	BTS-33K	
R72	10 Meg		4505	BTS-10 Meg	
R73	220KΩ		4618	BTS-220K	
R74	1.8Meg-5%		34612	BTS-1.8Meg-5%	
R75	470KΩ		4506	BTS-470K	
R76	560Ω	1	4631	BTA-560	
R77	1000Ω	2		BTB-1000	
R78	470KΩ		4823	BTS-470K	
R79	4.7Meg		4544	BTS-4.7Meg	

Note Some models use a 39KΩ resistor in this application.
● Items R88A, R88B, R88C, C69A, C69B, C69C are combined in one unit.

ITEM No.	RATING OHMS	RATING WATT	HOFFMAN PART No	IRC PART No.	NOTES
			REPLACEMENT DATA		
R80	3300Ω		34531	BTS-330K	
R81	82KΩ		34670	BTS-82K	
R82	18KΩ		4662	BTS-18K	
R83	1800Ω-5%		34517	BTS-1800-5%	
R84	1800Ω-5%		34517	BTS-1800-5%	
R85	390Ω		4549	BTS-390	
R86	22000-5%		34525	BTS-2200-5%	
R87	22000-5%		34525	BTS-2200-5%	
R88A	22KΩ			BTS-22K	
B	8200Ω		● 9695	6TM-8200	
C	6200Ω			BTS-6200	
R89	4.7Meg		4544	BTS-4.7Meg	
R90	1000Ω		4659	BTS-1000	
R91	180KΩ		34507	BTA-180K	
R92	1.2Meg		34593	BTS-1.2Meg	
R93	680KΩ	1	34521	BTA-680K	
R94	5600Ω		4639	BTS-5600	
R95	470Ω		4864	BTS-470	
R96	150KΩ	1		BTA-150K	
R97	1500Ω	1	4581	BTA-1500	
R98	100KΩ		4571	BTS-100K	
R99	100KΩ		4571	BTS-100K	
R100	470KΩ		4506	BTS-470K	
R101	4.7Meg		4544	BTS-4.7Meg	
R102	8200Ω		4651	BTS-8200	
R103	1500Ω-5%		4610	BTS-1500-5%	
R104	82KΩ		34670	BTS-82K-5%	
R105	180KΩ		4634	BTS-180K	
R106	1000Ω		4659	BTS-1000	
R107	4.7Meg		34859	BTS-4.7Meg	
R108	8300Ω		4651	BTS-8200	
R109	100Ω		4506		
R110	560KΩ		4590	BTS 560K	
R111	1200	2	4657	BW-2-120	
R112	6800Ω	2	24574		
R113	3.9Ω		4751		
R114	22Ω	2	14529		
R115	150Ω	10	4730	1 3/4A-150	
R116	150Ω	10	4730	1 3/4A-150	
R117A	1100Ω	10	4731		
B	800Ω				

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
					REPLACEMENT DATA				
T1	117VAC ② 1.95A	650VCT .250ADC	5VAC ③ 3A SEC 4 6.3VAC ④ 1.2A	6.3VAC ⑤ 5.2A SEC 5 6.3VAC ⑥ .85A	5030				R-49BS

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	DC RESISTANCE SEC.	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
			REPLACEMENT DATA					
T2	410Ω Tap ② 20Ω	40.2Ω Tap ③ 3.5Ω, 7.7Ω, 32.7Ω, 38.2Ω SEC 2 0Ω	5160			TFB-13 ①	D-19 ①	Horiz. Output Trans.
T3	1800Ω Tap ② 50Ω		5157	A-8141	A-3039	TSO-12	A-104X	Vert. Output Trans.
T4A	350		9729	DY-11A ②		TY-7	Y-19	Horiz. Deflection Coils
B	45Ω							Vert. Deflection Coil

① Wire as in orig. circuit except; connect present term #4 to new term #5. Connect present term "T" to new term #4.
② Use original horiz. deflection coil network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
					REPLACEMENT DATA					
T5	8KΩ	6.6Ω Tap ② 3.3Ω	448Ω	.92Ω Tap ② .56Ω	5169					

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	HOFFMAN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
				REPLACEMENT DATA			
SP1	5-1/4"	PM	3.3Ω	9067-1	ST-803 Mod. PS25-V	52A1	
SP2				9074 ①			① Two 8" x 11" speakers used in console Models only

COILS (RF-IF)

ITEM No	USE	DC RES PRI.	DC RES SEC.	HOFFMAN PART No.	MERIT PART No.	NOTES
				REPLACEMENT DATA		
L1	IF Trap	0Ω				Wound on 68MMF capacitor
L3	IF Trap	0Ω				Wound on 68MMF capacitor
L7A	Ant. Coil	0ΩCT	0Ω	5360R		Channel 3
B	Ant. Coil	0Ω CT	0Ω	5361R		Channel 3
C	Ant. Coil	0Ω CT	0Ω	5362R		Channel 4
D	Ant. Coil	0Ω CT	0Ω	5363R		Channel 5
E	Ant. Coil	0Ω CT	0Ω	5364R		Channel 6
F	Ant. Coil	0Ω CT	0Ω	5365R		Channel 7
G	Ant. Coil	0Ω CT	0Ω	5366R		Channel 8
H	Ant. Coil	0Ω CT	0Ω	5367R		Channel 9
I	Ant. Coil	0Ω CT	0Ω	5368R		Channel 10
J	Ant. Coil	0Ω CT	0Ω	5369R		Channel 11
K	Ant. Coil	0Ω CT	0Ω	5370R		Channel 12
L	Ant. Coil	0Ω CT	0Ω	5371R		Channel 13
L4	RF Choke	0Ω				
L5	Fil. Choke	0Ω				
L6	Neutralizing Coil	0Ω				
L7A	RF, Mixer Grid & Osc. Coil	0Ω		5348R		Channel 2
B	RF, Mixer Grid & Osc. Coil	0Ω		5349R		Channel 3
C	RF, Mixer Grid & Osc. Coil	0Ω		5350R		Channel 4
D	RF, Mixer Grid & Osc. Coil	0Ω		5351R		Channel 5
E	RF, Mixer Grid & Osc. Coil	0Ω		5352R		Channel 6
F	RF, Mixer Grid & Osc. Coil	0Ω		5353R		Channel 7
G	RF, Mixer Grid & Osc. Coil	0Ω		5354R		Channel 8
H	RF, Mixer Grid & Osc. Coil	0Ω		5355R		Channel 9
I	RF, Mixer Grid & Osc. Coil	0Ω		5356R		Channel 10
J	RF, Mixer Grid & Osc. Coil	0Ω		5357R		Channel 11
K	RF, Mixer Grid & Osc. Coil	0Ω		5358R		Channel 12
L	RF, Mixer Grid & Osc. Coil	0Ω		5359R		Channel 13
L8	Fil. Choke	0Ω				
L9	Feedback Coil	1.6Ω				
L10	RF Choke	0Ω				
L11	Conv. Plate	0Ω	0Ω			
L13	1st. Video IF	0Ω	.2Ω	5441		
L13	2nd. Video IF	.1Ω	.2Ω	5442		
L14	47.25MC Trap	.1Ω		5440		
L15	3rd. Video IF	.1Ω	.2Ω	5439		
L16	41.25MC Trap	0Ω		5438		
L17	Fil. Choke	0Ω		5133		
L18	4th. Video IF	.1Ω	.2Ω	5436		
L19	5th. Video IF	.1Ω	.2Ω	5439		
L20	Cathode Trap	.1Ω		5440		
L21	Series Peaking Coil †	14Ω			TV-188	560 Microhenries
L22	Shunt Peaking Coil	28Ω		5434		870 Microhenries
L23	Series Peaking Coil	6.5Ω		5433	TV-184 ■	150 Microhenries, wound on 39KΩ resistor
L24	Shunt Peaking Coil	5Ω		5340		350 Microhenries, wound on 10Meg resistor
L25	4.5MC Trap	2.6Ω		5403	TV-151	
L26	Fil. Choke	0Ω		5133		
L27	1st. Sound IF	5Ω		5430	TV-151	
L28	2nd. Sound IF	2.7Ω		5437	TV-151	
L29	Ratio Det.	4.5Ω	.1Ω CT	5439	TV-115 ▲	Tertiary Winding - 1.45Ω
L30	Horiz. Osc.	75Ω		5300	TV-163	
L31	RF Choke	0Ω		5266		
L32	RF Choke	0Ω		5266		
L33	Horiz. Lin.	6.5Ω		5422		Tapped ② 4Ω
L34	Width Coil	2.5Ω		5457	MWC-2 *	

* Enlarge mounting hole.
▲ Use adaptor plate
† Some Models use 150 microhenries series peaking coil wound on 39KΩ resistor in this application.
■ Parallel with 39KΩ resistor.

FUSES

ITEM No	TYPE	RATING	HOFFMAN PART No FUSE	HOFFMAN PART No HOLDER	LITTELFUSE PART No FUSE	LITTELFUSE PART No HOLDER	BUSS PART No FUSE	BUSS PART No HOLDER
			REPLACEMENT DATA					
M1	3AG (Slo-Blo)	3A 125V	9648		313003 (3AG-3A Slo-Blo)	342001	MDL-3	HKP
M2	3AG	1/4A 250V	9615		312.250	357001	AGC-1/4	4405

PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA Hoffman PART No.		NOTES
M3	Bayonet	6-8	.25	Blue			Type #44

MISCELLANEOUS

ITEM No.	PART NAME	Hoffman PART No.	NOTES
M4	RF Tuner	9758	
M5	Switch	6028	Speaker Selector
M6	Centering Magnet	9722	
M7	Ion Trap	9713	
	Cabinet	7676	Mahogany, Model 21M115
	Cabinet	7677	Blonde oak, Model 21B116
	Cabinet	7688	Mahogany, Model 21M308
	Cabinet	7689	Oak, Model 21B309
	Cabinet	7690	Cherry, Model 21P310
	Cabinet	7664	Mahogany, Model 21M700
	Cabinet	7665	Oak, Model 21B701
	Cabinet	7666	Cherry, Model 21P702
	Safety Glass	769	Models 21M115, 21B116
	Safety Glass	773	Model 21M308, 21B390, 21P310, 21M700, 21B701, 21P702
	Mask	3816	Models 21M115, 21B116
	Mask	3853	Models 21M308, 21B309, 21P310, 21M700, 21B701, 21P702
	Back Cover	33563	Models 21M115, 21B116
	Back Cover	33578	Models 21M308, 21B309, 21P310
	Back Cover	33579	Models 21M700, 21B701, 21P702
	Cover, Front Controls	33582	All Models
	Knob	33560C	Channel Selector, All Models
	Knob	33520C	Off/On Volume , All Models
	Knob	33505	Contrast, All Models
	Knob	3813	Brightness, All Models
	Knob	3814	Vertical Hold, All models
	Knob	3863	Tone, Models 21M115, 21B116
	Knob	3862	Tone, Models 21M308, 21B309, 21P310, 21M700, 21B701, 21P702

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be occomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

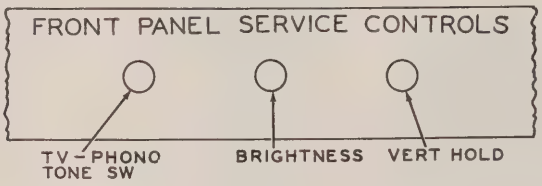
PICTURE TUBE SAFETY GLASS CLEANING

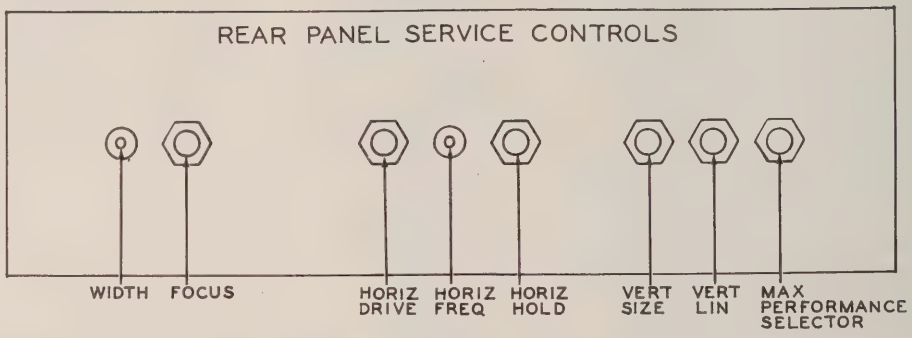
For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassemble instructions.).

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horiz. frequency slug can be made from the rear of chassis (see location above). For correct adjustment see HORIZONTAL SWEEP CIRCUIT ADJ.

SPECIAL ADJUSTMENTS

MAXIMUM PERFORMANCE SELECTOR ADJUSTMENT - Adjust this control for best picture quality on a strong TV signal.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary (L29) located on top of chassis. (See tube placement-chart).

FUSES

Two fuses are used, one for AC line protection and one for Horiz. sweep circuit protection. For location see tube placement chart.

CENTERING

Centering is accomplished by mechanically adjusting two magnet rings on neck of picture tube just behind the yoke. Rotate both magnets to obtain proper centering.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 7 wood screws. Remove rear cover.
3. Disconnect built-in antenna and speaker.
4. Remove 4 chassis bolts. Remove chassis.
5. Remove 4 speaker nuts. Remove speaker. (Not necessary for chassis removal).

PHOTOFACT* Folder

PACKARD-BELL MODELS 2115, 2116 (Ch. 2115-2), 2117 (Ch. 2117)

3924

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 2116

PACKARD-BELL MODELS 2115, 2116 (Ch. 2115-2), 2117 (Ch. 2117)

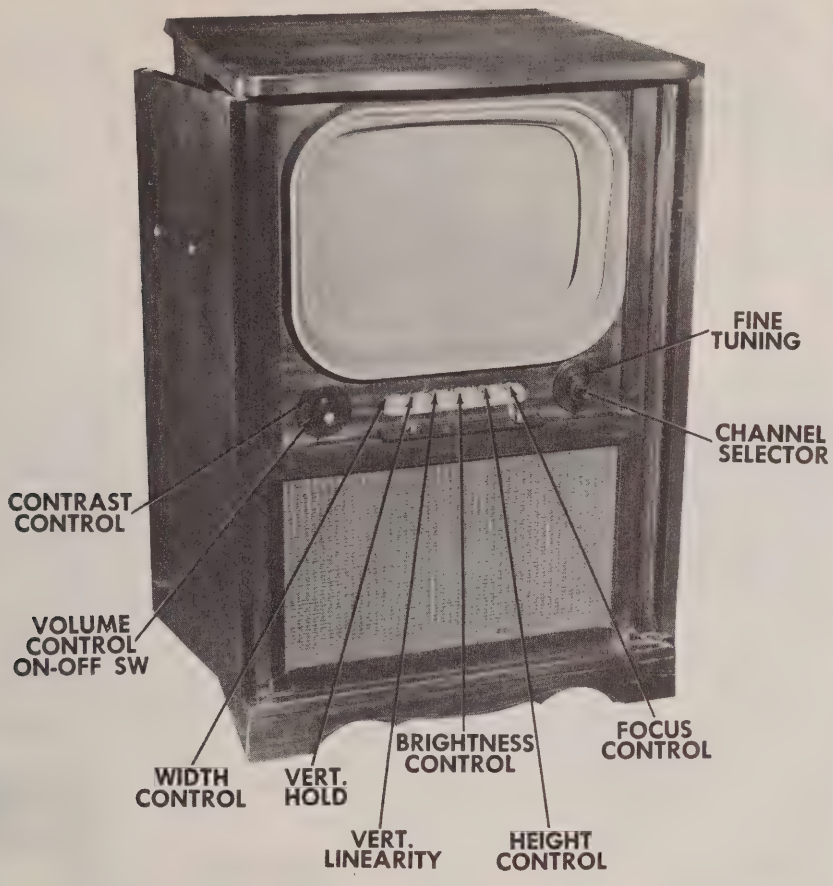
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of Americq. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2-53 SET 195 FOLDER 9

PACKARD-BELL MODELS 2115, 2116 (Ch. 2115-2), 2117 (Ch. 2117)

PROPERTY OF
U.S. NAVY SHIPYARD
SHIPYARD ST.
DENVER, COLORADO



PACKARD-BELL 2116 (Deluxe)

TRADE NAME	Packard-Bell Models 2115, 2116 (Standard), 2116 (Deluxe), (Ch. 2115-2), 2117 (Standard), 2115 (Deluxe)(Ch. 2117)
MANUFACTURER	Packard-Bell Co., Service Div., 11th & Hope Sts., Los Angeles, 15, Calif.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC -60 Cycle RATING 1.62 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13, Video IF 25MC, Sound IF 20.5MC (Intercarrier)

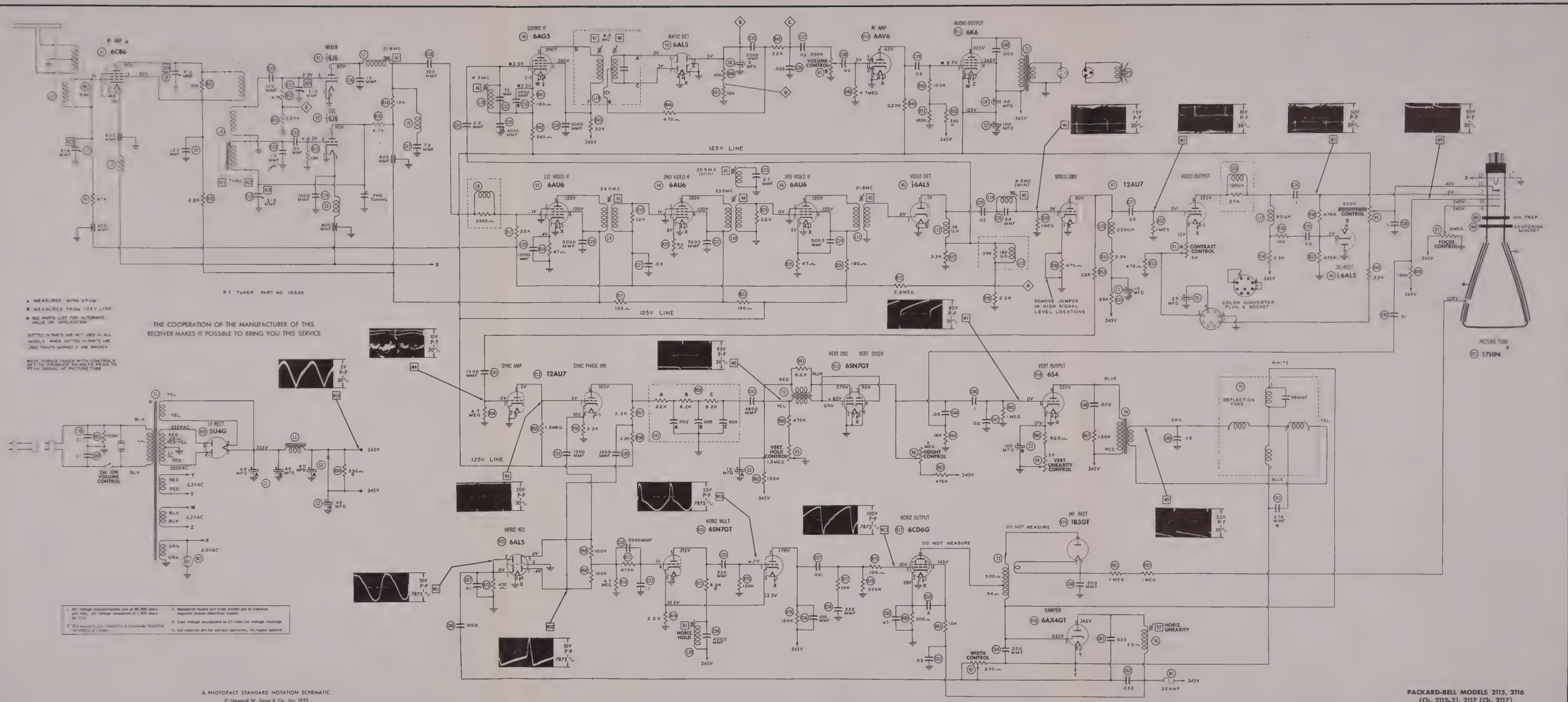
INDEX

Alignment Instructions 6, 7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 14, 15, 16
Photographs
Cabinet - Rear View 11
Capacitor and Alignment Identification 4,9
Chassis - Top View 3
RF Tuner 10
Photographs (Cont)
Resistor and Inductor Identification 12, 17
Resistance Measurements 8
Schematic (Alternate Tuner) 18
Schematic (TV) 2
Servicing in the Field 13
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

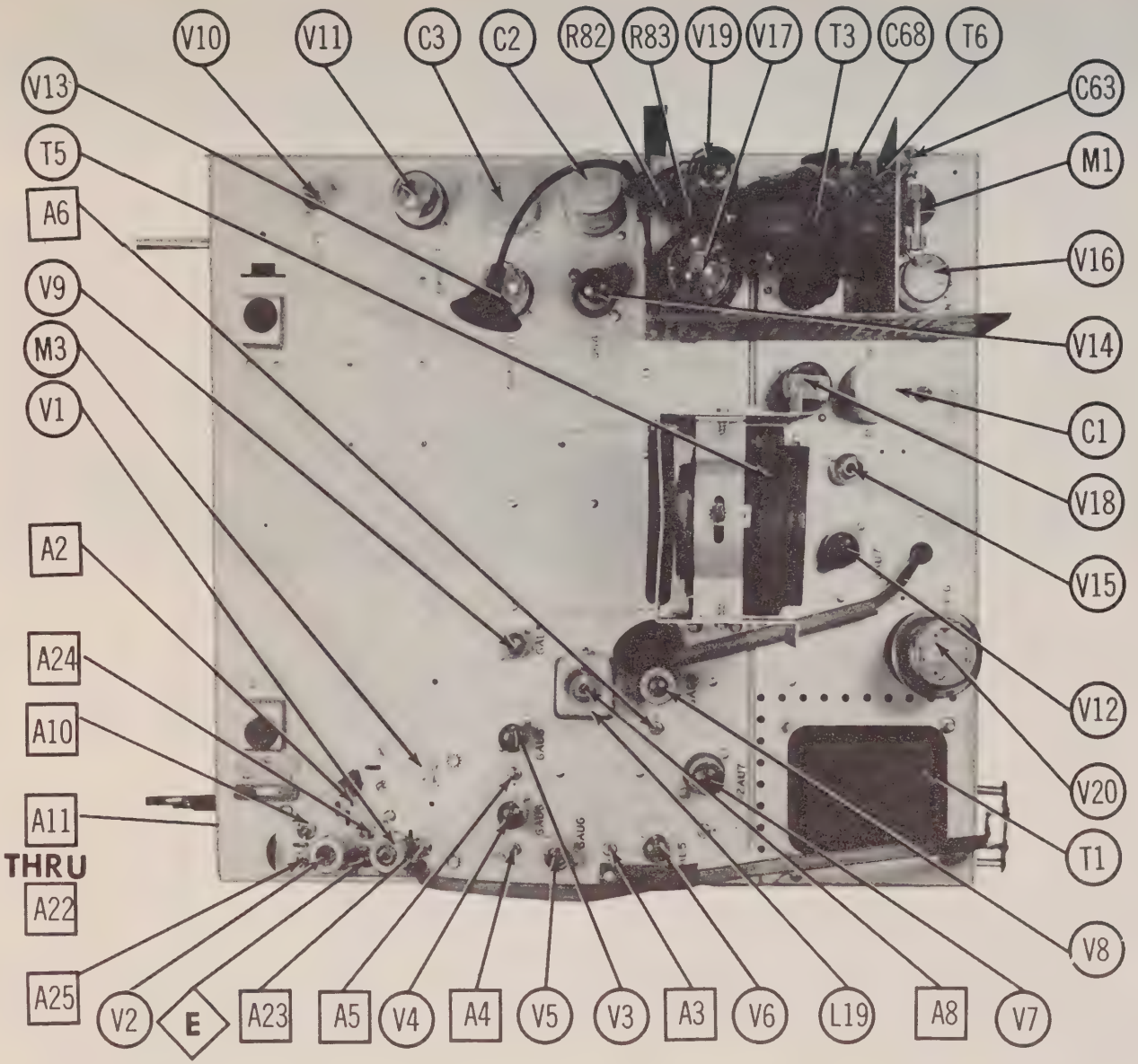
PACKARD-BELL MODELS 2115, 2116 (Ch. 2115-2), 2117 (Ch. 2117)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

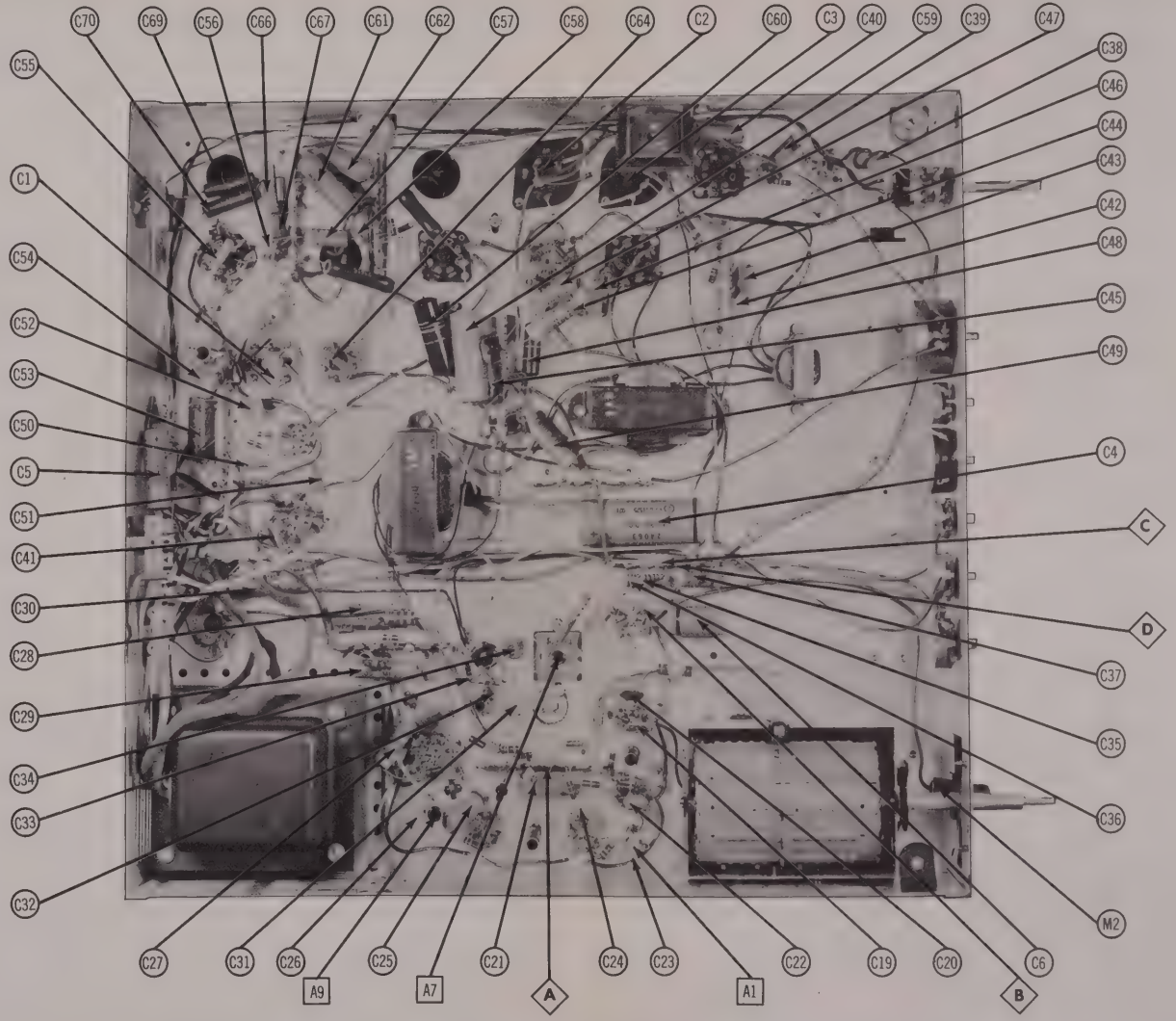
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


R-F AMP V1 6CB6
MIXER V2 6J6
OSC V3 6J6
R-F TUNER PART NO 10530
SOUND IF V9 6AG5
RATIO DET V5 6AL5
AF AMP V10 6AV6
AUDIO OUTPUT V11 6K6
VOLUME CONTROL
1ST VIDEO IF V3 6AU6
2ND VIDEO IF V4 6AU6
3RD VIDEO IF V5 6AU6
VIDEO DET V6 1/2 6AL5
4.5MC (MINT)
V7 12AU7
VIDEO OUTPUT
CONTRAST CONTROL
DC REST V6 1/2 6AL5
500K CONTROL
FOCUS CONTROL
ION TRAP
CENTERING MAGNET
PICTURE TUBE V21 17HP4
COLOR CONVERTER PLUG & SOCKET
REMOVE JUMPER IN HIGH SIGNAL LEVEL LOCATIONS
125V LINE
SYNC AMP V12 12AU7
SYNC PHASE INV
VERT OSC VERT DISCH V13 6SN7GT
VERT OUTPUT V14 6S4
HEIGHT CONTROL
VERT LINEARITY CONTROL
VERT HOLD CONTROL
DEFLECTION YOKE
HORIZ AFC V15 6AL5
HORIZ MULT V16 6SN7GT
HORIZ OUTPUT V17 6CD6G
HV RECT V19 1B3GT
DAMPER V18 6AX4GT
HORIZ LINEARITY
HORIZ HOLD
WIDTH CONTROL
LV RECT V20 5U4G
SW ON VOLUME CONTROL
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A MEASURED WITH VTVM
B MEASURED FROM 125V LINE
B SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED: IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. [illegible]
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953
PACKARD-BELL MODELS 2115, 2116 (Ch. 2115-2), 2117 (Ch. 2117)

PACKARD-BELL MODELS 2115, 2116 (Ch. 2115-2), 2117 (Ch. 2117)

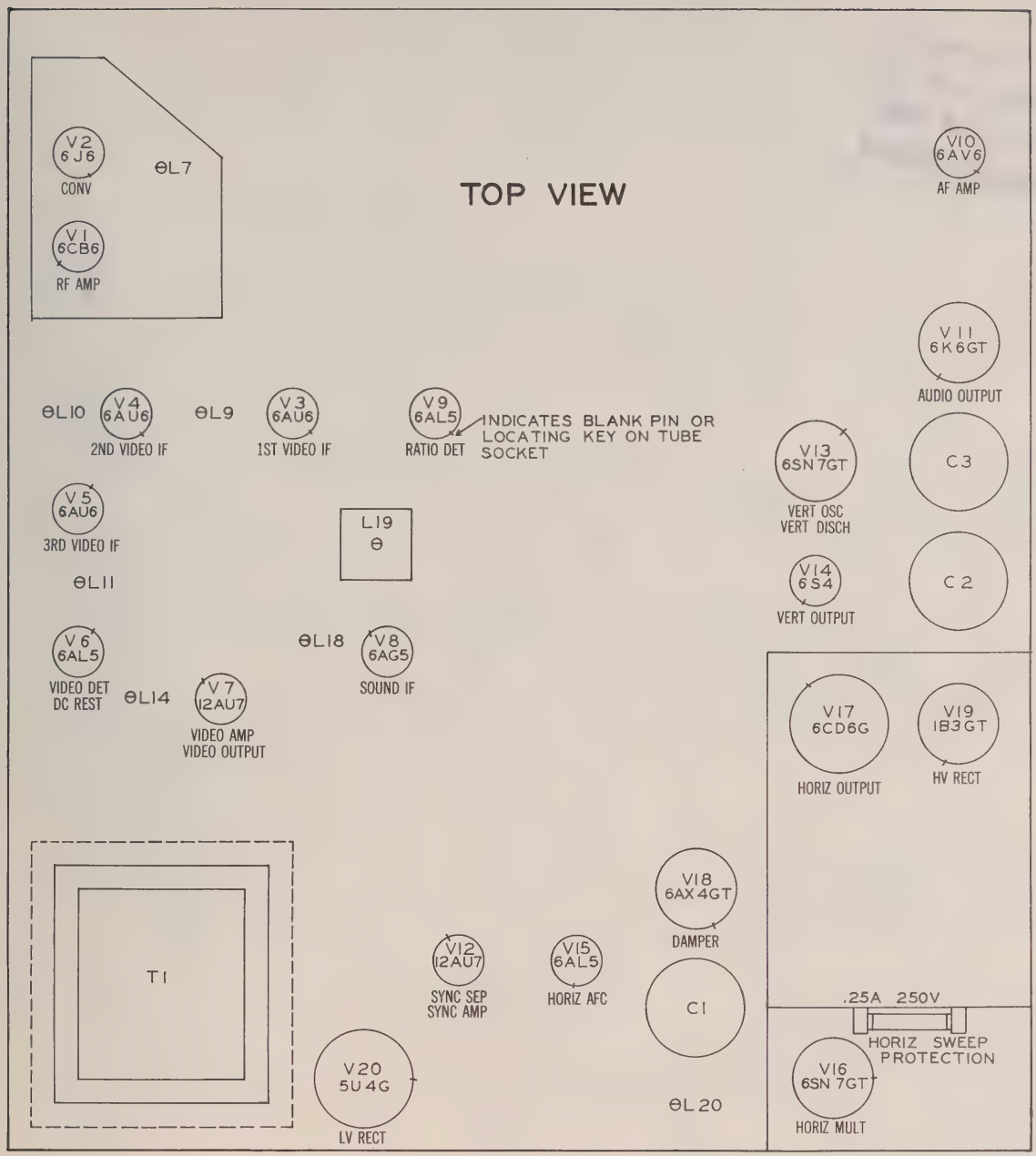


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6, V11
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V6, V7, V21
Has pic, no sound-V8, V9, V10, V11

SYNC FAILURE
No vert. sync-V12, V13
No horiz. sync-V12, V15, V16
No vert. or horiz. sync. -V12

SWEEP FAILURE
No raster, has sound-V16, V17, V18, V19, V21, Fuse (M1)
No vertical deflection-V13, V14
Poor vert. linearity or foldover-V13, V14
Poor horiz. linearity or foldover-V16, V17, V18
Narrow picture-V16, V17, V18, V19, V20
Vert. off freq. -V12, V13
Horiz. off freq. -V12, V15, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube (V16).

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	20.5MC (Unmod)	Any	DC probe to point ◇A◇ Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	21.8MC	"	"	A2, A3	Adjust for maximum deflection.
3.	"	"	23.0MC	"	"	A4	"
4.	"	"	24.0MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	20.5MC 21.8MC 25.0MC	Any	Vert. Amp. to point ◇A◇. Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A2 thru A5 for desired response. Keep generator output low enough to avoid distortion of response curve.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.001MFD	High side to point ◇A◇. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point ◇B◇. Common to chassis.	A6, A7	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point ◇C◇. Common to point ◇D◇.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD	High side to point ◇A◇. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point ◇B◇. Low side to chassis.	A6, A7	Disconnect stabilizer capacitor, C6. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
7.	"	"	"	"	"	Vert. Amp. to point ◇C◇. Low side to chassis.	A8	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Set contrast control for maximum contrast.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.001MFD	High side to point ◇A◇. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru detector (Fig. 4) to pin 2 of picture tube. Common to chassis.	A9	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A10. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A10 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point ◇A◇. Low side to chassis.	A11	Adjust to place sound marker in trap notch of response curve as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (E). Low side to chassis.	A23, A24 A25	Adjust for response curve similar to Fig. 6.
11.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel make compromise adjustments of A23, A24 and A25 with channel switch set to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

DENVER, COLORADO

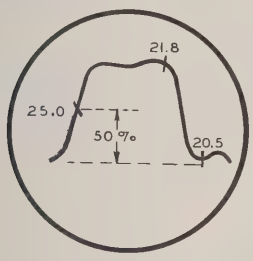


FIG.1

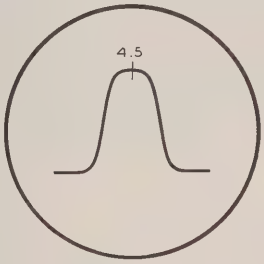


FIG.2

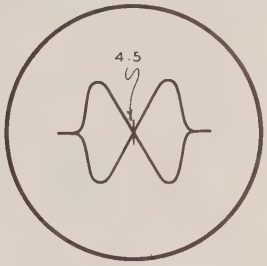


FIG. 3

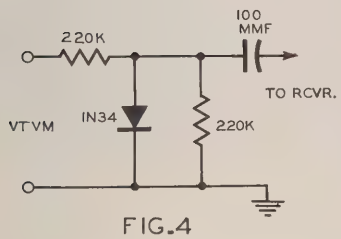


FIG.4

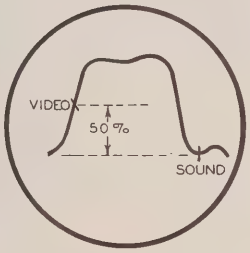


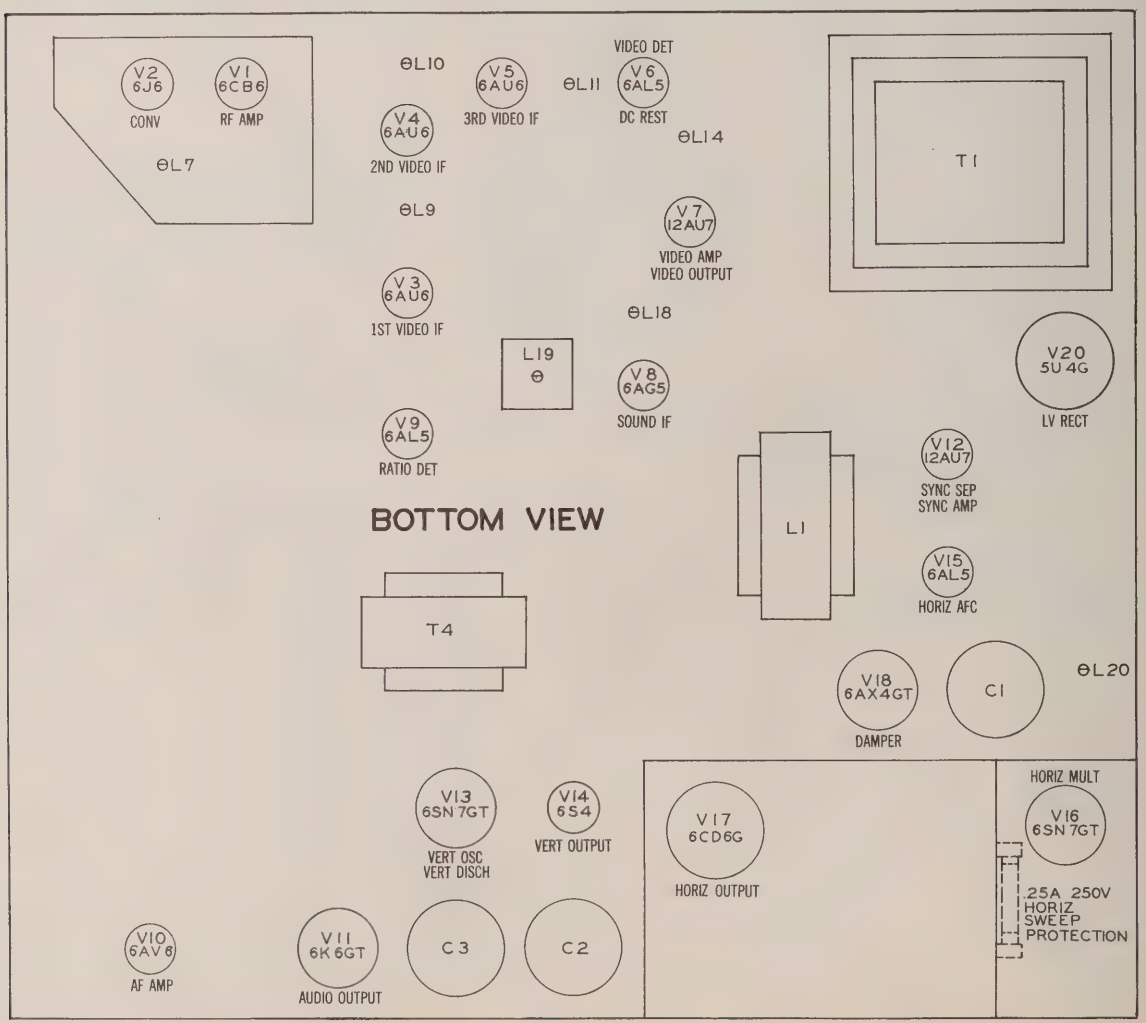
FIG.5

FIG.6

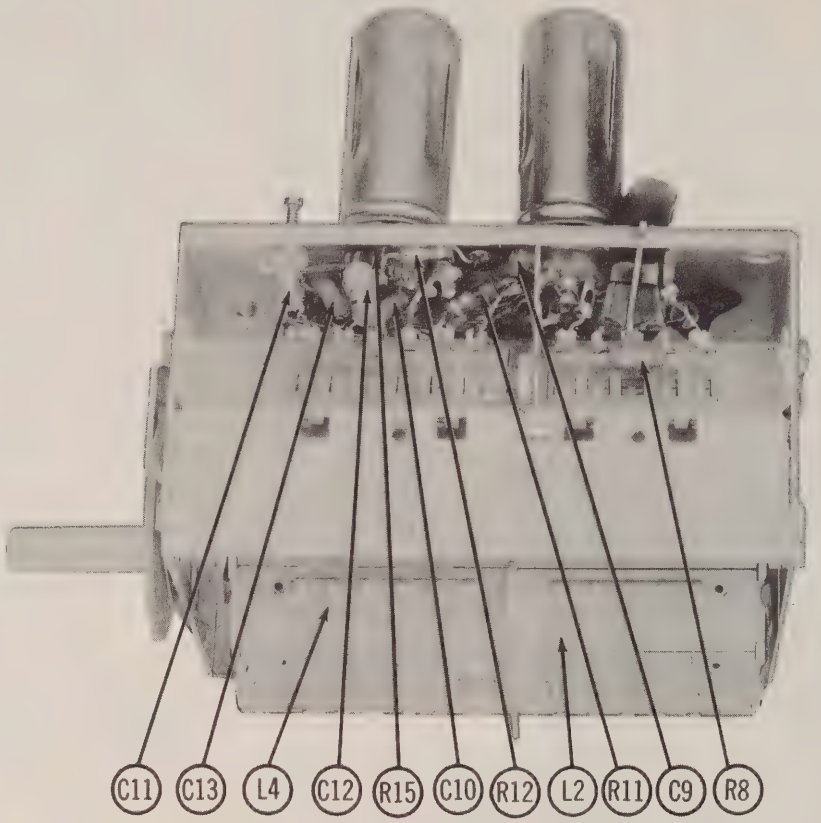
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2.2Meg	0Ω	.1Ω	0Ω	#2.4KΩ	#2.4KΩ	0Ω		
V 2	6J6	#5KΩ	#15.4KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	2.2Meg	0Ω	.1Ω	0Ω	#200Ω	#200Ω	47Ω		
V 4	6AU6	2.2Meg	0Ω	.1Ω	0Ω	#100Ω	#100Ω	82Ω		
V 5	6AU6	.3Ω	0Ω	.1Ω	0Ω	#180Ω	#180Ω	47Ω		
V 6	6AL5	.3Ω	0Ω	.1Ω	0Ω	470KΩ	0Ω	3.3KΩ		
V 7	12AU7	† 36KΩ	1Meg	0Ω	.1Ω	.1Ω	† 3.3KΩ	1Meg	850Ω	0Ω
V 8	6AG5	#560Ω	#740Ω	#.1Ω	#0Ω	† 33KΩ	† 33KΩ	#740Ω		
V 9	6AL5	0Ω	20KΩ	.1Ω	0Ω	INF	0Ω	INF		
V 10	6AV6	4.7Meg	0Ω	.1Ω	0Ω	INF	INF	#220KΩ		
V 11	6K6CT	.4Ω	#.1Ω	† 660Ω	† 42Ω	† 240KΩ	† 140KΩ	#0Ω	#0Ω	
V 12	12AU7	#1.5Meg	4.7Meg	0Ω	.1Ω	.1Ω	#6.6KΩ	#1.5Meg	3.3KΩ	0Ω
V 13	6SN7GT	1.2Meg	† 150KΩ	0Ω	1.2Meg	† 1.6Meg	0Ω	0Ω	.1Ω	
V 14	6S4	INF	1.2KΩ	INF	0Ω	.1Ω	1Meg	INF	INF	† 812Ω
V 15	6AL5	470Ω	470Ω	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 16	6SN7GT	150KΩ	† 150KΩ	2.2KΩ	5.2Meg	† 8.3KΩ	2.2KΩ	.1Ω	0Ω	
V 17	6CD6G	INF	0Ω	300Ω	INF	330KΩ	INF	.1Ω	†10KΩ	TOP CAP ■94Ω
V 18	6AX4GT	INF	INF	INF	INF	† 75Ω	INF	■49Ω	■49Ω	
V 19	1B3GT	PINS 1 TO 8 HAVE INF RESISTANCE.								TOP CAP ■594Ω
V 20	5U4G	INF	60KΩ	INF	28Ω	INF	27Ω	INF	60KΩ	
V 21	17HP4	0Ω	940KΩ	PIN 6 †25KΩ	PIN 10 † 150KΩ	PIN 11 02KΩ	PIN 12 .1Ω			

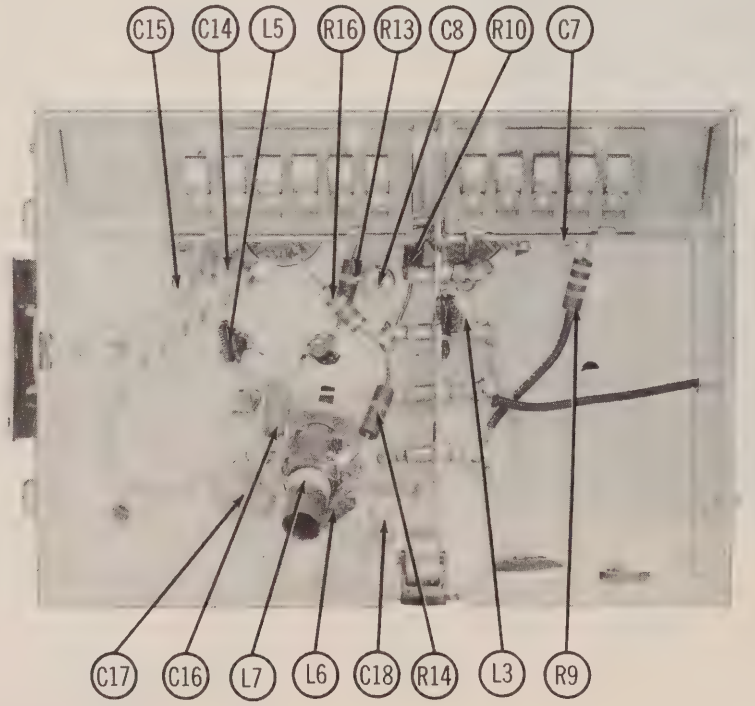
† MEASURED FROM PIN 2 OF V20.
# MEASURED FROM 125 VOLT LINE.
■ MEASURED FROM PIN 3 OF V18.



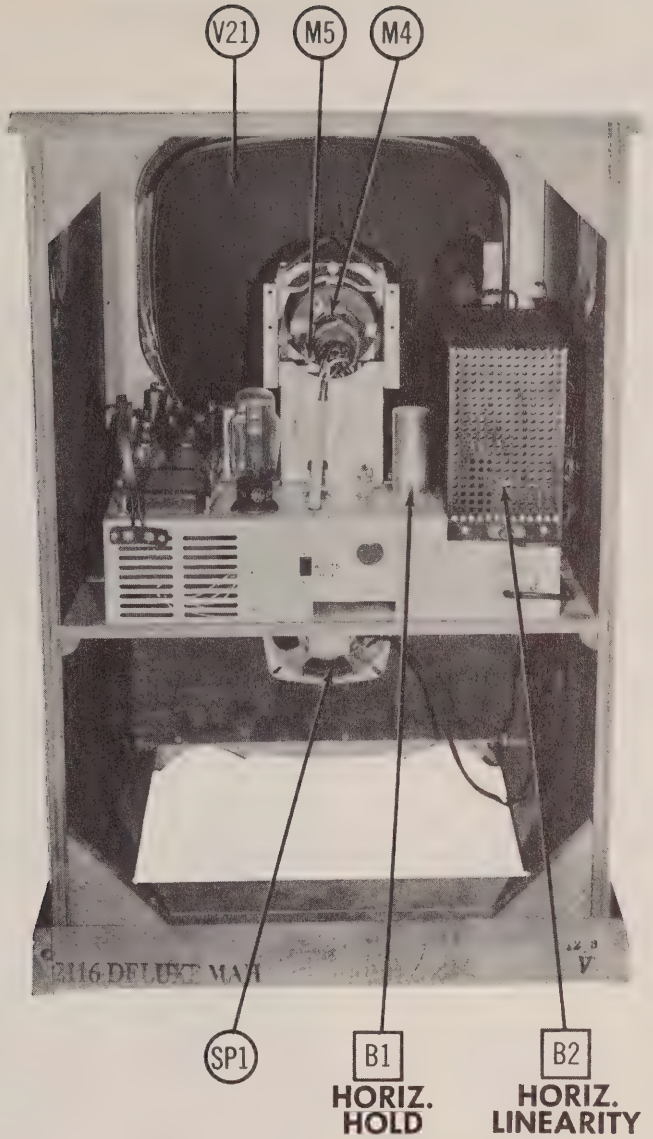
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

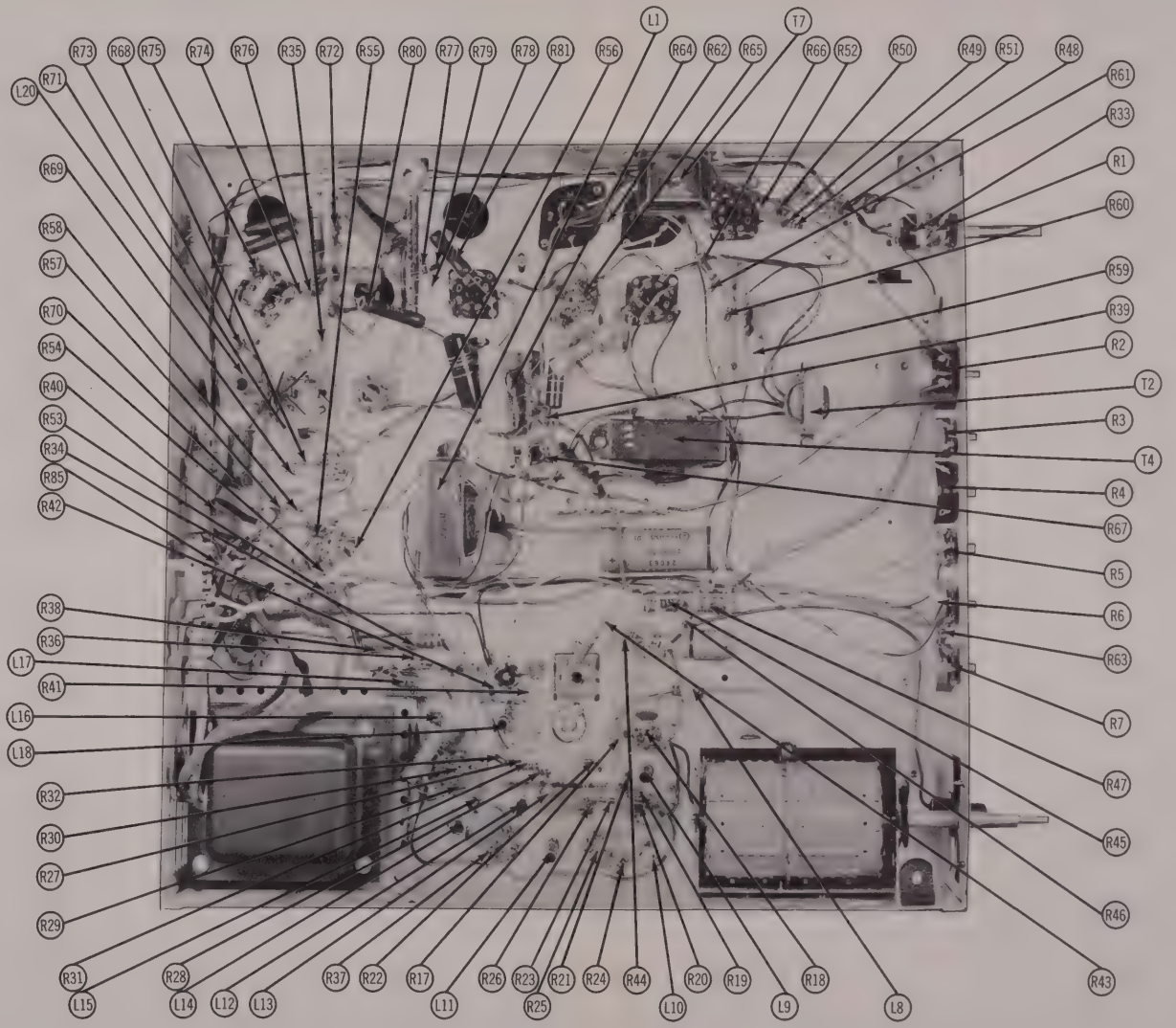
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold slug (B1) until the picture synchronizes horizontally. Momentarily interrupt the signal by switching off channel and back. Retouch B1, if necessary, for most stable horizontal sync.

Adjust the width control for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B2) for a picture that is symmetrical from left to right.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning Knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

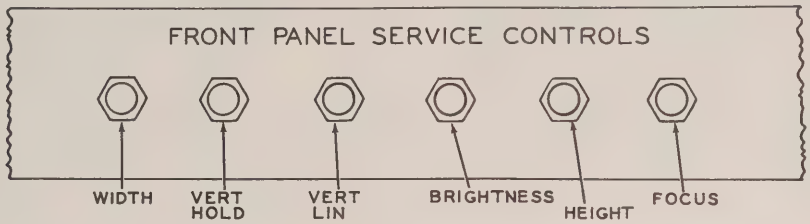
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For the adjustment of the Horiz. Oscillator Slug, it is necessary to remove the rear cover, and supply power to set with a cheater cord. Adjustment is located on top of chassis. (See tube placement chart).

DISCRIMINATOR ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary (L19) located on top of chassis. (see tube placement chart).

FUSES

One fuse is used for Horiz. Sweep Circuit protection. For location see tube placement chart.

CENTERING

Centering is accomplished mechanically, located almost flush against the yoke. Rotate centering magnet slowly around neck of the tube until picture is properly centered.

PROPERTY OF
S. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLOR...

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type conteol knobs from front panel.
2. Remove 17 wood screws. Remove rear cover.
3. Disconnect speaker.
4. Remove 4 chassis bolts. Remove chassis.
5. Remove 4 wood screws. Remove speaker (Not necessary for chassis removal.)

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6CB6	6CB6	7CM	
B	RF Amplifier	6AG5	6AG5	7BD	
C	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V7	Video Amplifier-Video Output	12AU7	12AU7	9A	
V8	Sound IF Amp.	6AG5	6AG5	7BD	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6AV6	6AV6	7BT	
V11	Audio Output	6K6GT	6K6GT	7S	
V12	Sync Amp.-Sync Phase Inv.	12AU7	12AU7	9A	
V13	Vert. Oscillator-Vert. Discharge	6SN7GT	6SN7GT	6BD	
V14	Vert. Output	6S4	6S4	9AC	
V15	Horiz. AFC	6AL5	6AL5	6BT	
V16	Horiz. Mult.	6SN7GT	6SN7GT	6BD	
V17	Horiz. Output	6CD6G	6CD6G	5BT	
V18A	Damper	6AX4GT	6AX4GT	4CG	
B	Damper	6U4GT	6U4GT	4CG	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Packard-Bell PART No.	REPLACEMENT DATA: SYLVANIA	RTMA BASE TYPE	NOTES
V21A	17HP4	17HP4	12C	
B	17KP4		12D	
C	20HP4		12C	
D	20JP4		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±40	450	24061	AFH3-155		C061		FP398	TVL-2764	
B	±40	450							TVA-1955	
C	±10	500								
C2A	±40	450	24055	AFH3-159		C138		FP375	TVL-3764	
B	±40	450								
C	±100	200								
C3A	±10	450	24062	AFH2-93		BO67		FP387.1	TVL-2810	
B	±100	50								
C4	40	350	24065	PRS450/40		BR4045A		TC78	TVA-1611	
C5	25	25	24004A	PRS25/25		BR252A		TC26	TVA-1205	
C6	5	50	24038	PRS150/4		BR550		TC30	TVA-1303	
C7	3-9				829-3					
C8	.5-3				829-3			CT565A		
C9	120		SI120	D6-121	TM5T12	GP2K-121		UC-5312	5GA-T12	
C10	100		SI100	D6-101	TM5T1	GP1K-101		UC-531	5GA-T1	
C11	.5-3			829-3				CT565A		
C12	20		SI20NP0	TCZ-20		NP0K-200		ZT-542	5TCC-Q2	
C13	10		SI10N750	TCN-10		N750K-100		NT-541	5TCU-Q1	
C14	1000		SI1000	D6-102	TM5D1	GP3L-102		UC-521	5HK-D1	
C15	.5-3			829-3				CT565A		
C16	10		SI10NP0	TCZ-10		NP0K-100		ZT-541	5TCC-Q1	
C17	73				829-3					
C18	300		SI300	D6-301		GP2K-301		UC-533	5GA-T3	
C19	5000		23931	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C20	10000		23939	BPD-01	DD-103	TM5D1	821-01	DC-511	5HK-D1	
C21	.05	200	23017	P288-05	DF-503	PJ25S		PT415	2TM-S5	
C22	5000		23931	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C23	22				TCZ-22					
C24	5000		23931	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C25	.05	800	23017	P288-05	DF-503	PJ25S		PT415	2TM-S5	
C26	56		23922		TCZ-56		NP0-333-560			
C27	.05	800	23010	P688-05	DF-503	PTE8S		PT615	6TM-S5	
C28	.1	800	23012	P688-1	DF-104	PTE8P1		PT601	6TM-P1	
C29	.05	800	23010	P688-05	DF-503	PTE8S		PT615	6TM-S5	
C30	.1	800	23012	P688-1	DF-104	PTE4P1		PT401	4TM-P1	
C31	2.2		23952		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C32	75			SI75	D6-750		NP0K-750	UC-5475	5GA-Q75	
C33A	4000		23955	BPD-2X004	D6-402	TM5DD4	822-004	DCD-524	5HK-2D4	
B	4000				D6-402					
C34	5000		23931	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C35	5000		23931	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C36	.003	800	23016	P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C37	.05	800	23007	P688-05	DF-503	PTE8S		PT615	6TM-S5	
C38	.02	800	23007	P688-02	DF-203	PTE8S2		PT612	6TM-S2	
C39	.02	800	23007	P688-03	DF-203	PTE8S2		PT612	6TM-S2	
C40	.005	800	23004	P688-005	D6-502	PTE8D5	GP2-333-502	PT625	6TM-D5	
C41	1500		23936	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C42A	.002			P688-002		PTE6D2		PT622		
B	.005		+23951	P688-005	+PC-100	PTE8D5	+1405-01	PT625	+101C1	
C	.005			P688-005		PTE8D5		PT625		
C43	4900	500	23207	1464-005		1DR5D5		MCB465	MB-25	
C44	.05	600	23010	P688-05	DF-503	PTE8S5		PT615	6TM-S5	
C45	.01	600	23003	P688-01	D6-103	PTE8S1	GP2-333-103	PT611	6TM-S1	
C46	.1	600	23012	P688-1	DF-104	PTE6P1		PT601	6TM-P1	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C47	.02	600	23007	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C48	.022	600	23007	P688-022	DF-203	PTE6S22		PT612	6TM-S22	
C49	.05	600	23010	P688-05	DF-503	PTE8S		PT615	6TM-S5	
C50	1500		23936	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C51	1500		23936	SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C52	5000		23931	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C53	.1	200	23012	P688-1	DF-104	PTE4P1		PT401	4TM-P1	
C54	4000	500	23208	1464-004		1DR5D4		MCB463	MB-24	
C55	320	500	23214	1468-00035						
C56	100		23914	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C57	.001	600	23001	P688-001	D6-102	PTE6D1	GP2L-102	UC-5333	5GA-T33	
C58	330		23944	SI330	D6-331		GP2K-331	UC-5333		
C59	.2	600	23037	684-2				TP419	2TM-P47	
C60	.47	200	23035	P288-47		PJ2P5		PT405		
C61	.033	600	23031	P688-033		PTE6S33		PT6133		
C62	.033	600	23031	P688-033		PTE6S33		PT6133		
C63	.05	600	23010	P688-05		PTE6S5		PT615	6TM-S5	
C64	200	5000	23986							Note 1
C65	270	1000	23220							
C66	.002	1000	23038	P1GH8-002		PTE1GD2		PT611	MB-D1	
C67	.01	600	23023	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C68	500	20000	23959	HV30C	TV3-502	MM-C20T5	413-501	HV-20055	20DK-T5	
C69	.01	125VAC	23932							
C70	.01	125VAC	23932							

Note 1. Not used in all Models.
• Items C42A, C42B, C43C, R59A, R59B, R59C are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	Packard-Bell PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω		25835-A	CJ-36*	RTV-212	SBB-627-S	UF53R1	Contrast -- Panel
B	500KΩ						UR55A†	Volume -- Rear
C	Switch						UB-20†	Attach to R1B.
R2A	250Ω	4	25836-A		A10-300			Width -- Wire Wound
B	Shaft		Not. Req.		FKS-1/4			Attach to R2A.
R3A	1.5Meg	½	25840	QU-138	AG-83-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A.
R4A	5000Ω	2	25807	WK-5000	A43-5000	VK-135	R5000L	Vert. Linearity -- Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A.
R5A	500KΩ	½	25832	QU-133	AG-58-S	AB-59	SU-50	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	3Meg	½	25805-D	QU-140	AG-84-S	AB-84	SU-59	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A.
R7A	3Meg	½	25805-D	QU-140	AG-84-S	AB-84	SU-59	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A.

* CONCENTRIKIT EQUIVALENT - KIT K-3, BASE ELEMENTS & SHAFTS, B17-114 & P1-112 (Panel)
B13-133 & R2-204 (Rear) & SWITCH 76-1
† Universal replacement -- (Mallory exact duplicate -- Part No. UF5252).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	Packard-Bell PART No.	IRC PART No.	NOTES
R8	3900Ω	½		BTS-3900	
R9	47KΩ	½			
R10	2200Ω	½		BTS-2200	
R11	100KΩ	½			
R12	4700Ω	½		BTS-4700	
R13	220KΩ	½			
R14	10KΩ	½			
R15	10KΩ	½			
R16	4700Ω	½		BTS-4700	
R17	56KΩ	½	73041		
R18	47Ω	½	73009		
R19	12KΩ	½	73040		
R20	82Ω	½	73012	BTS-82	
R21	100Ω	½	73013	BTS-100	
R22	2.2Meg	½	73185	BTS-2.2Meg	
R23	100Ω	½	73013	BTS-100	
R24	22KΩ	½	73041		
R25	47Ω	½	73009		
R26	180Ω	½	73016	BTS-180	
R27	3300Ω	½	73031	BTS-3300	
R28	2200Ω	½	73029	BTS-2200	
R29	1Meg	½	73181	BTS-1Meg	
R30	470Ω	½	73021	BTS-470	
R31	3300Ω	½	73031	BTS-3300	
R32	1Meg	½	73181	BTS-1Meg	
R33	470Ω	½	73021	BTS-470	
R34	3300Ω	2	73431	BTB-3300	
R35	33KΩ	2	73443	BTB-33K	
R36	10KΩ	½	73037	BTS-10K	
R37	470KΩ	½	73157	BTS-470K	
R38	470KΩ	½	73157	BTS-470K	
R39	150KΩ	½	73151	BTS-150K	
R40	33KΩ	½	73043	BTS-33K	
R41	180Ω	½	73018	BTS-180	
R42	560Ω	½	73023	BTS-560	
R43	33KΩ	2	73443	BTB-33K	
R44	470Ω	½	73021	BTS-470	
R45	22KΩ	½	73041	BTS-22K	
R46	10KΩ	½	73037	BTS-10K	
R47	10KΩ	½	73037	BTS-10K	

ITEM No.	RATING: OHMS	RATING: WATT	Packard-Bell PART No.	IRC PART No.	NOTES
R48	4.7Meg	½	73189	BTS-4.7Meg	
R49	220KΩ	½	73153	BTS-220K	
R50	100KΩ	½	73149	BTS-100K	
R51	180KΩ	½	73052	BTS-180K	
R52	330KΩ	½	73055	BTS-330K	
R53	22KΩ	½	73041	BTS-22K	
R54	4.7Meg	½	73189	BTS-4.7Meg	
R55	1.5Meg	½	73183	BTS-1.5Meg	
R56	3300Ω	½	73031	BTS-3300	
R57	3300Ω	½	73031	BTS-3300	
R58	3300Ω	½	73031	BTS-3300	
R59A	22KΩ	½		BTS-22K	
B	8200Ω	½	+23951	BTS-8200	
C	8200Ω	½		BTS-8200	
R60	470KΩ	½	73157	BTS-470K	
R61	8200Ω	½	73036	BTS-8200	
R62	150KΩ	½	73151	BTS-150K	
R63	470KΩ	½	73157	BTS-470K	
R64	18KΩ	½	73040	BTS-18K	
R65	1Meg	½	73181	BTS-1Meg	
R66	820Ω	1	73224	BTA-820	
R67	150KΩ	½	73151	BTS-150K	
R68	100KΩ	½	73149	BTS-100K	
R69	100KΩ	½	73149	BTS-100K	
R70	4.7Meg	½	73189	BTS-4.7Meg	
R71	470KΩ	½	73157	BTS-470K	
R72	470Ω	½	73021	BTS-470	
R73	8200Ω	½	73036	BTS-8200	
R74	2200Ω	½	73029	BTS-2200	
R75	150KΩ 5%	½		BTS-150K 5%	
R76	150KΩ	½	73051	BTS-150K	
R77	10KΩ	½	73037	BTS-10K	
R78	330KΩ	½	73055	BTS-330K	
R79	100Ω	½	73149		
R80	300Ω	10	73815	1-3/4A-300	
R81	10KΩ	5	73642	1-3/4A-10K	
R82	1Meg	1	73398		
R83	1Meg	1	73398		
R84	330Ω	20	73618		Note 2
R85	100KΩ	½	73149	BTS-100K	

Note 1. Some Models use a 10KΩ resistor in this application.
Note 2. Used only with power transformer #89038.
• Items R59A, R59B, R59C, C42A, C42B, C42C are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING: PRI	RATING: SEC 1	RATING: SEC 2	RATING: SEC 3	Packard Bell PART No	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	RCA PART No
T1	117V AC	670VCT	5V A.	6.3V AC	89036			P-3070	TP-356 ①	
	1.62A	170 ADC	3A	4.1A						
			SEC. 4	SEC. 5						
			6.3V AC	6.3V AC						
			2.2A	6A						

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No	RATING: DC RESISTANCE PRI	RATING: DC RESISTANCE SEC	Packard-Bell PART No	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No	RCA PART No	NOTES
T2	230Ω	1250Ω	89031	A-8125	A-3000 ①	TBO-1 ②	A-97X	208T2 ②	Vert. Osc. Trans. Horiz. Output Trans.
T3	594Ω tap	0Ω	89432-C	A-8131	HVO-8	TFB-6	DA-20		
	964Ω		89432-A ③						Vert. Output Trans.
T4	270Ω	.7Ω	89431	A-8140 ④	A-3080 ⑤	TSO-8 ④	A-103X		Horiz. Deflection Coils
T5A	490Ω		29537	DY-10 ⑥	MDP-30	TF-4 ⑦	Y-20 ⑧		Vert. Deflection Coils
B	3.5Ω				MWC-1 ⑨				Horiz. Lin. Coil
T6	53Ω		29504						

① Drill one new mounting hole.
② Mount on top of chassis.
③ Alternate horiz. output trans.
④ Drill new mounting holes.
⑤ Use original horiz. deflection coil capacitor.
⑥ Enlarge mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	Packard-Bell PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T7	5.8KΩ	3.8Ω	618Ω	.69Ω	89427	A-3677	A-2930	RO-9 ①	S-3X	

① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V C IMP	Packard-Bell PART No	JENSEN PART No	QUAM PART No	NOTES
SP1	6"	PM	3.3Ω	83302	ST-10# Mod. P6-X	6A1	

FILTER CHOKE

ITEM No	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~/s	Packard-Bell PART No	STANCOR PART No	MERIT PART No	CHICAGO PART No	TRIAD PART No
L1	.170ADC	42Ω	1.8 Hy.	27005	C-3325	C-2991	TR-3300 ①	C-17X ①

① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	Packard-Bell PART No.	MERIT PART No	NOTES
L2	Ant. Coils	0Ω	0Ω			
L3	Fil. Choke	0Ω				
L4	RF, Mixer Grid & Osc. Coils	0Ω				
L5	Fil. Choke	0Ω				
L6	RF Choke	.4Ω				
L7	1st. Video IF	.6Ω				
L8	IF Coupling	.8Ω		29523		Wound on 3.3KΩ resistor
L9	2nd. Video IF	.3Ω	.3Ω	29055		
L10	Fil. Video IF	.3Ω	.3Ω	29055		Includes trap
L11	4th. Video IF	.3Ω	.3Ω	29056		
L12	Shunt Peaking Coil	4Ω		29520	TV-180	36 Microhenries
L13	Shunt Peaking Coil	9.5Ω		29508	TV-183	180 Microhenries, wound on 39KΩ resistor
L14	4.5MC Trap	1.8Ω		29529	TV-151	
L15	Shunt Peaking Coil	10.5Ω		29509	TV-185	250 Microhenries
L16	Series Peaking Coil	7Ω		29506	TV-182	120 Microhenries, wound on 27KΩ resistor.
L17	Shunt Peaking Coil	6.5Ω		29507	TV-181	93 Microhenries
L18	Sound IF	1Ω		29053	TV-151	
L19	Ratio Det.	4.2Ω	.22ΩCT	29054	TV-115 •	Tertiary Winding - .8Ω
L20	Horiz. Osc.	100Ω		29527	TV-163	

* Use adaptor plate

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

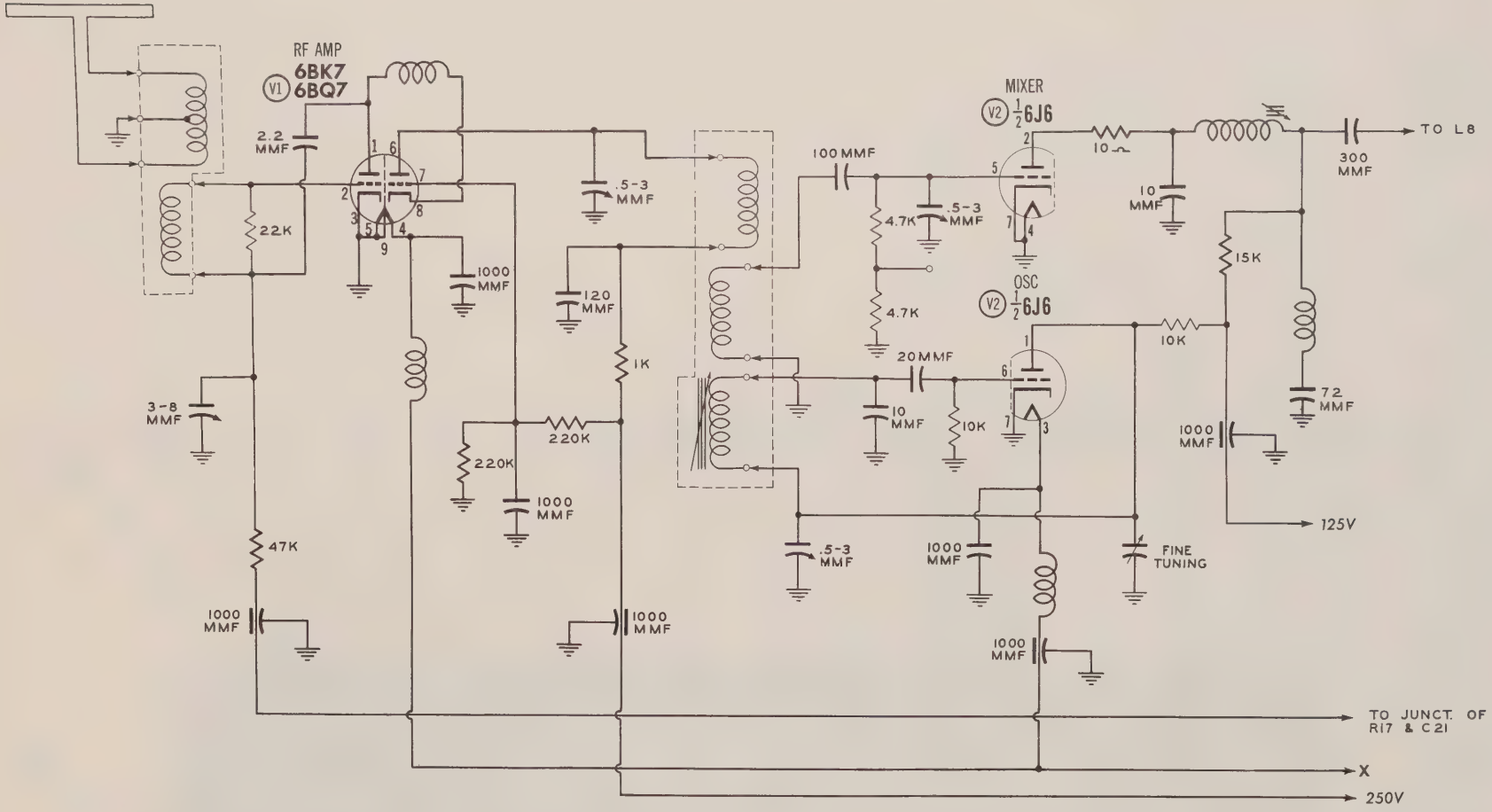
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Packard-Bell PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1/4A 250V	45004		312.250 (3AG-1/4A)	357001	AGC-1/4	4405

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Packard-Bell PART No.		
M2	Bayonet	6-8	.25	Blue	54001		Type #44

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M3A	RF Tuner	10530	
B	RF Tuner	10528	Alternate
C	RF Tuner	10531	Alternate
M4	Centering Magnet	28075	
M5	Ion Trap	28049	
	Cabinet	(State Model No. and finish)	
	Knob	52067-1	State Color (Channel Selector, All Models)
	Knob	52069-1	State Color (Off/On Volume, All Models)
	Knob	52070	State Color (Contrast, All Models)
	Mask Assembly	55026	Models 2115, 2116 (Standard) and 2116 (Deluxe)
	Mask Assembly	55027	Models 2117 (Standard) and 2117 (Deluxe)
	Safety Glass	55026-2	Models 2115, 2116 (Standard) and 2116 (Deluxe)
	Safety Glass	55027-2	Models 2117 (Standard) and 2117 (Deluxe)
	Escutcheon	41039	All Models (State Color)



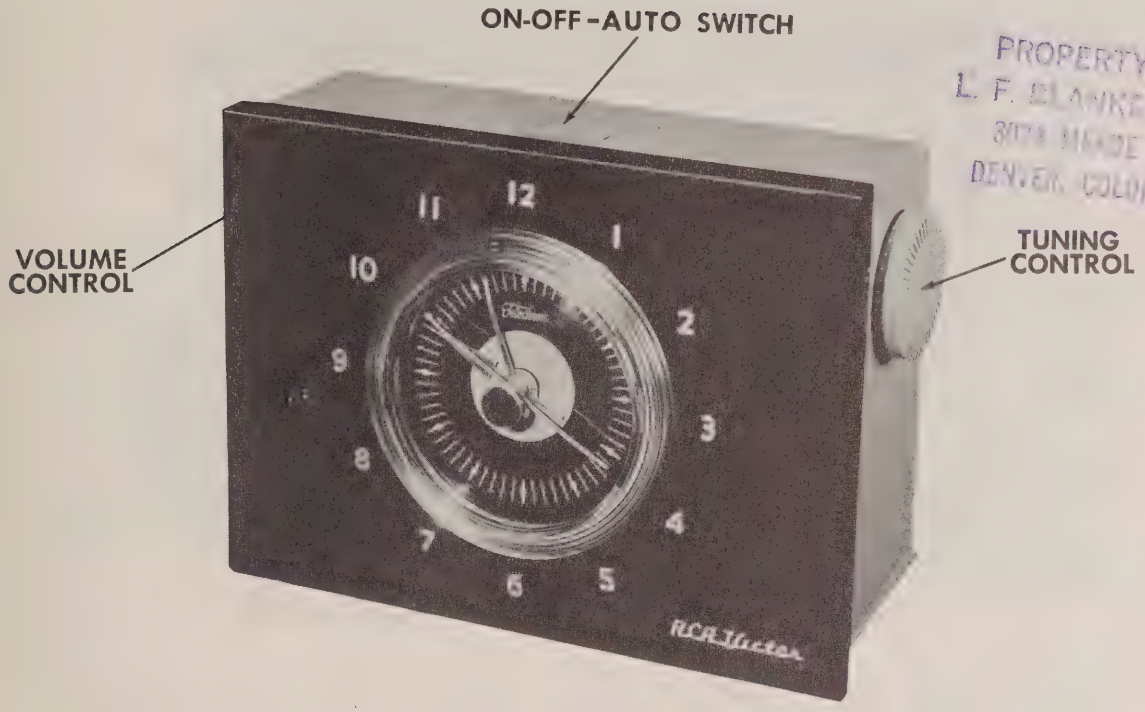
R F TUNER PART 10531

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1953

ALTERNATE TUNER SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3104 MEADE ST.
DENVER, COLORADO



RCA VICTOR MODELS 2-C-511, 2-C-512, 2-C-513, 2-C-514 (Ch. RC1118, A, B, C)

RCA VICTOR MODELS 2-C-511, 2-C-512, 2-C-513, 2-C-514 (Ch. RC1118, A, B, C)

TRADE NAME	RCA Victor, Model 2-C-511(Ch.RC1118), 2-C-512 (Ch.RC1118A), 2-C-513 (Ch.RC1118B), 2-C-514 (Ch.RC1118C)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N.J.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Four)	Types 12BE6 Conv., 6BJ6 IF Amp., 12AV6 Det.-AVC-AF Amp., 6AK6 Audio Output
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING .16 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540 - 1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.
Volume control should be at maximum position . Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alginment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 1 (grid) of 6BJ6 (V2). Low side to chassis.	455 KC (400~Mod.)	Quiet point near 1600 KC	Across voice coil	A1, A2	Adjust for maximum output.
2.	"	High side to stator plates of antenna section of tuning gang. Low side to chassis.	"	"	"	A3, A4	"
3.		Loop	1620 KC	Tuning gang fully open	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	1400 KC	Tune to 1400 KC signal	"	A6	"
5.		"	600 KC	Tune to 600 KC signal	"	A7	Adjust for maximum output while rocking tuning gang. Repeat steps 3, 4 and 5 for optimum results.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 2-C-511 (Ch. RC1118)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	6BJ6	6BJ6	7CM	
V3	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	6AK6	6AK6	7BK	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	77427	PRS150/50-30		BRD5315		TCD497	TVA-2450	Red
B	30	150								Green
C2	47		74609	SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C3	4.7		77471							
C4	.047	400	77422	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C5	390		75641	SI390	D6-391		GP2K-391	UC-5339	5GA-T39	
C6	.01	200	77424	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C7	470		75198	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C8	.0015	200	77425	P485-0015	D6-152		GP2L-152		6TM-D15	
C9	.0056	400	77488							
C10	.047	400	75071	P488-047		PTE4S47		PT4147	4TM-S47	
C11	.1	400	77423	P488-1		PTE4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	77409	Q13-133	AG-60-Z	B-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

RESISTORS

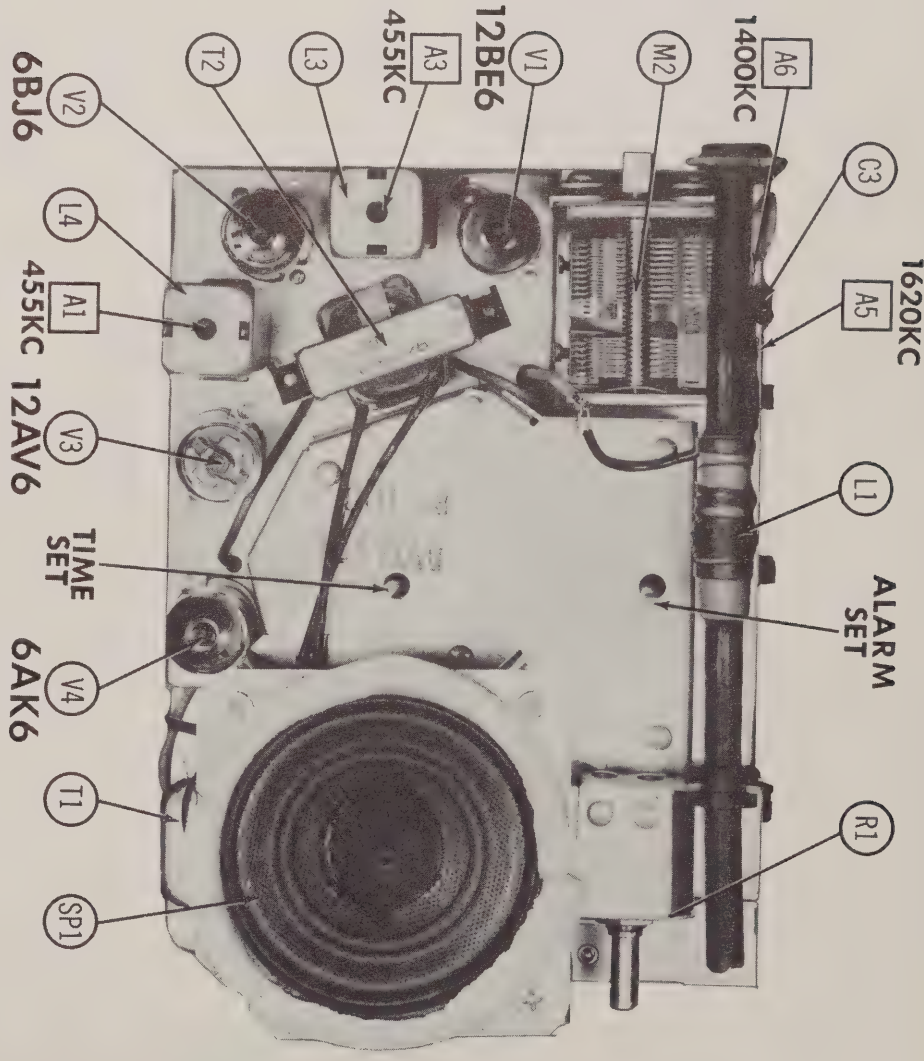
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R2	33KΩ	½	503333	BTS-33K	
R3	100Ω	½	503110		
R4	3.3Meg	½	503533	BTS-3.3Meg	
R5	47KΩ	½	503347	BTS-47K	
R6	4.7Meg	½	503547	BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA Victor PART No.	IRC PART No.	
R7	330KΩ	½	503433	BTS-330K	
R8	820KΩ	½	503482	BTS-820K	
R9	390Ω	½	503139	BTS-390	
R10	1500Ω	2	532215	BTB-1500	
R11	22Ω	½	503022		

TRANSFORMER (FILAMENT)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .07A tap @ 37V @ .15A				77413				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		RCA Victor PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	6.5KΩ	3.3Ω	390Ω	.41Ω	77414	A-3329	A-2931 ①	RO-13 ①	S-7X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	RCA Victor PART No.	JENSEN PART No.	QUAM PART No.	
SP1	3"	PM	3.3Ω	77428			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	RCA Victor PART No.	MERIT PART No.	
L1	Loop Ant.	.9Ω		77410		
L2	Osc. Coil	.8Ω	6.8Ω	77411		
L3	Input IF	17.5Ω	17.5Ω	77416	BC-352	
L4	Output IF	7.5Ω	7Ω	77417	BC-355	

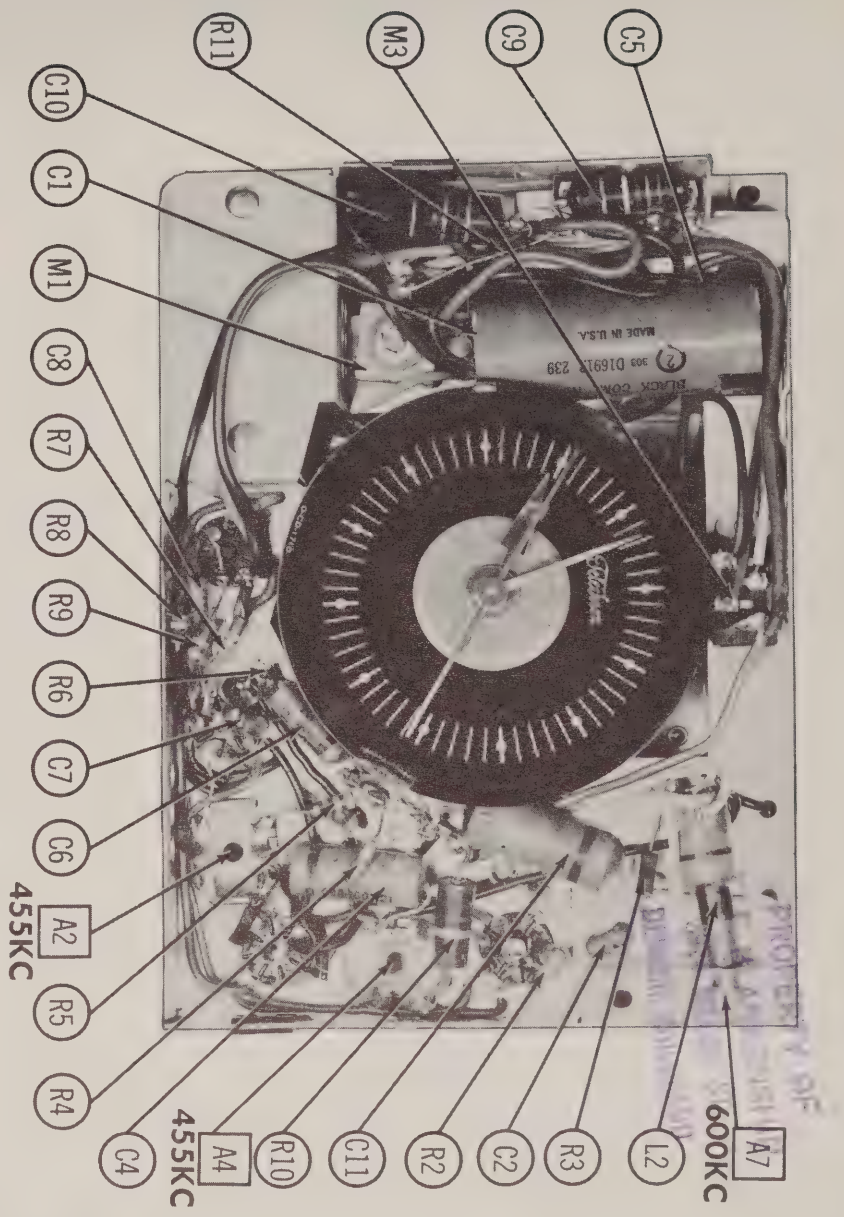
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	RCA Victor PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.28A	77292		8J1	1 2 14B		35

MISCELLANEOUS

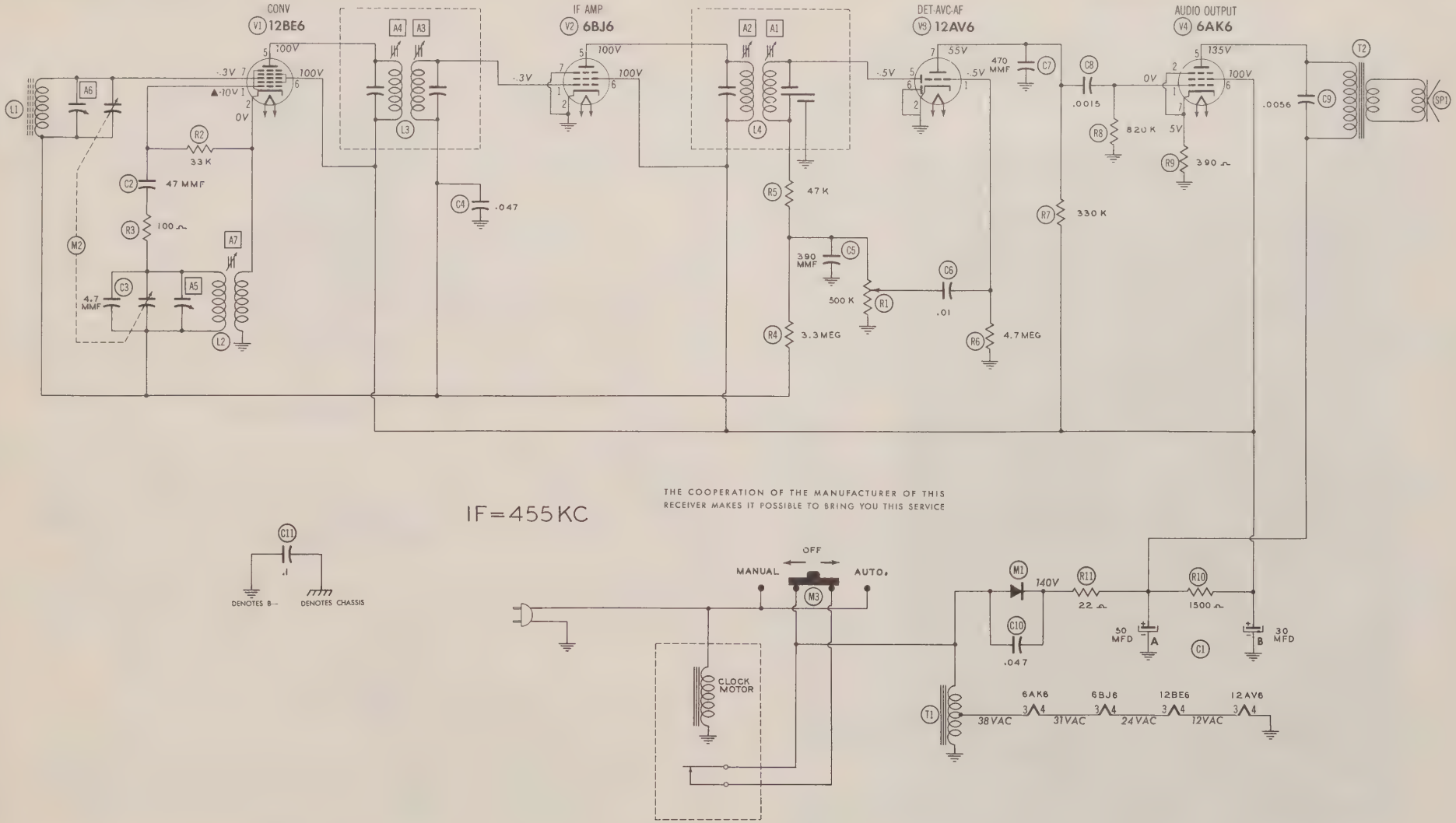
ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M2	Tuning Capacitor	77408	36-313MMF, 28-136MMF
M3	Switch	77415	Function Selector
	Cabinet	77429	Black (Complete with window), Model 2C511
	Cabinet	77504	Ivory (Complete with window), Model 2C512
	Cabinet	77506	Red (Complete with window), Model 2C513
	Cabinet	77508	Gray (Complete with window), Model 2C514
	Back Cover	77430	Gray Tan, Model 2C511
	Back Cover	77505	Ivory, Model 2C512
	Back Cover	77507	Red, Model 2C513
	Back Cover	77509	Gray, Model 2C514
	Knob	77431	Dial, Gray Tan, Model 2C511
	Knob	77498	Dial, Ivory, Model 2C512
	Knob	77499	Dial, Red, Model 2C513
	Knob	77500	Dial, Gray, Model 2C514
	Knob	77432	Volume, Gray Tan, Model 2C511
	Knob	77501	Volume, Ivory, Model 2C512
	Knob	77502	Volume, Red, Model 2C513
	Knob	77503	Volume, Gray, Model 2C514
	Knob	77412	Timer (2 Used)

CHASSIS—TOP VIEW



RCA VICTOR MODEL 2-C-511 (Ch. RC1118)

RCA VICTOR MODEL 2-C-511 (Ch. RC1118)



RESISTANCE READINGS

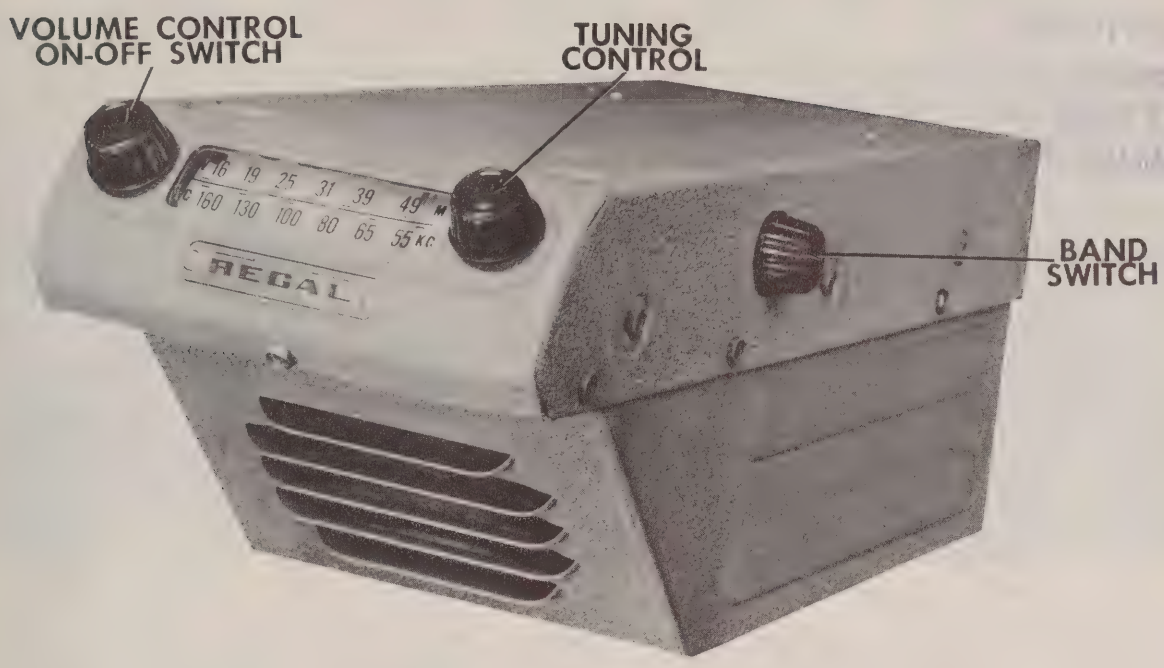
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	33KΩ	.8Ω	17Ω	10Ω	†1.5KΩ	†1.5KΩ	3.8Meg
V 2	6BJ6	3.8Meg	0Ω	19Ω	17Ω	†1.5KΩ	†1.5KΩ	0Ω
V 3	12AV6	4.7Meg	0Ω	10Ω	0Ω	547KΩ	0Ω	†330KΩ
V 4	6AK6	820KΩ	390Ω	22Ω	19.2	†412Ω	†1.5KΩ	390Ω

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM OUTPUT OF M1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1953

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



REGAL
MODEL CR762

REGAL
MODEL CR762

TRADE NAME	Regal Model CR762
MANUFACTURER	Regal Electronics Corp., 605 W. 130th.St., New York, N.Y.
TYPE SET	Battery Operated AM Superheterodyne Universal Automobile Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 (or) 6AV6 Det.-AVC-AF Amp., 6AS5 Audio Output, 6X5GT (or) 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.1 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1650 KC — SHORT WAVE 5.8MC - 18.3MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	456KC (400%Mod)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to pin 1 (grid) of 6BA6 (V1). Low side to chassis.	"	"	"	"	A5	Adjust for MINIMUM output.
3.	200Ω Carbon Resistor	High side thru 200Ω to antenna receptacle Low side to chassis.	18.3MC	SW	"	"	A6	Adjust for maximum output. If two peaks are obtained use the one with trimmer screw further in.
4.	"	"	15MC	"	Approximately 19 meters	"	A7	Adjust for maximum output while rocking tuning gang.
5.	30MMF	High side thru 30MMF to antenna receptacle Low side to chassis.	1400KC	BC	Tune to 1400KC signal	"	A8	Adjust for maximum output.
6.	"	"	600 KC	"	Tune to 600 KC signal	"	A9	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		REGAL PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4A	Det.-AVC-AF Amp	6AT6	6AT6	7BT	
B	Det.-AVC-AF Amp	6AV6	6AV6	7BT	
V5	Audio Output	6AS5	6AS5	7CV	
V6A	Rectifier	6X5GT	6X5GT	6S	
B	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	REGAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲20	200	60-109	AFH3-107		CO71			TVL-3565	
B	■20	200								
C	25	25								
C2	.05	200	50-104	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	2200	500								Note 1
C4	100		55-102	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C5	50									Note 2
C6	.05	200	50-104	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C7	.05	200	50-104	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C8	250		55-103	SI250	D6-251	5W5T25	GP2K-251	UC-5325		
C9	100		T55-44	SI100	D6-101	TM5T1	GP1K-101	UC-531		
C10	.005	600	55-118	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	Note 3
C11	.01	400	50-102	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C12	.02	600	50-109	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C13	.01	1600		P1688-01		PTE16S1		PT1611	MB-S1	Note 5
C14	.5	120	50-117	P185-5		MP2P5		RF480	68P20	
C15	250		55-103	SI250	D6-251	5W5T25	GP2K-251	UC-5325	5GA-T25	
C16	250		55-103	SI250	D6-251	5W5T25	GP2K-251	UC-5325	5GA-T25	
C17	.5	120	50-117	P185-5		MP2P5		RF480	68P20	
C18	.005	600	55-118	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	Note 4
C19	.5	120	50-117	P185-5		MP2P5		RF480	68P20	Note 4

Note 1. Some Models use .005MFD in this application (Part #55-118)
Note 2. Some Models use 100MMF in this application
Note 3. Some Models use .01MFD in this application (Part #50-102)
Note 4. Not used in all Models.
Note 5. Some Models use .004MFD in this application (Part #50-118).

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	REGAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	20-107	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume-Note
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

Note: Some Models use alternate control (part #20-103)

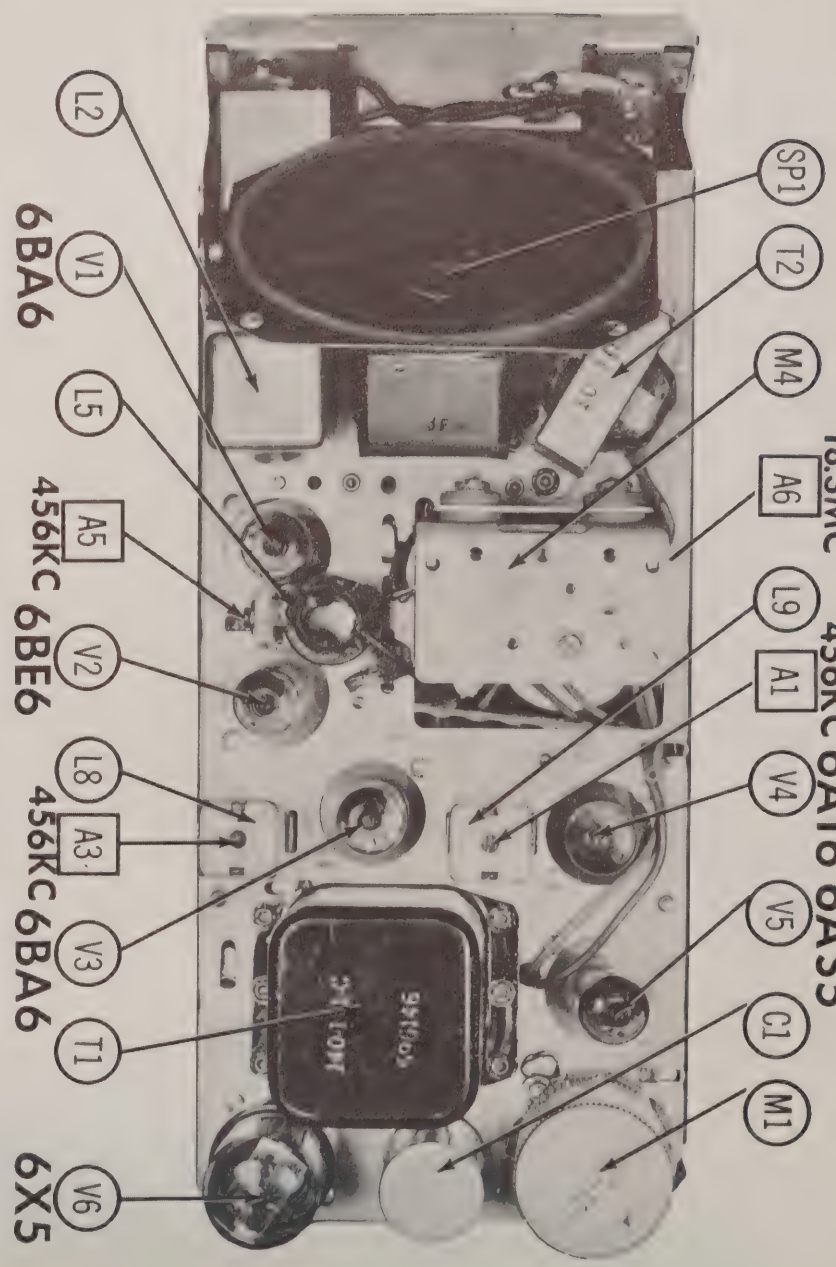
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	REGAL PART No.	IRC PART No.	
R2	100KΩ	½	65-107	BTS-100K	
R3	3300Ω	½	65-176	BTS-330	
R4	100KΩ	½	65-124	BTS-100K	
R5	22KΩ	½		BTS-22K	
R6	47KΩ	½	65-35	BTS-47K	
R7	1Meg	½	65-126	BTS-1Meg	
R8	6800Ω	½	65-131	BTS-6800	
R9	10Meg	½	65-129	BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	REGAL PART No.	IRC PART No.	
R10	220KΩ	½	65-108	BTS-220K	
R11	270KΩ	½		BTS-270K	Note
R12	220KΩ	½	65-159	BTS-220	
R13	2200Ω	½	65-175	BTS-220	
R14	2200Ω	2		BTB-2200	
R15	220Ω	½	65-159	BTS-220	
R16	220Ω	½	65-159	BTS-220	

Note: Some Models use a 220KΩ resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	REGAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC 2.3ADC	320VCT .045ADC			140-111				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		REGAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	2.3KΩ	3.5Ω	200Ω	.6Ω	110-108	A-3876	A-2928	RO-2	S-2X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	REGAL PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.5Ω	110-108	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	REGAL PART No.	MERIT PART No.	
L1	BC Ant. Coil	.4Ω				
L2	BC Ant. Coil	3.2Ω		30-144		Tapped @ 2.2Ω
L3	SW Ant. Coil	.7Ω		30-164		Tapped @ .6Ω
L4	RF Choke	2.4Ω		30-167		Wound on resistor
L5	IF Trap Coil	53Ω		30-106		
L6	BC Osc. Coil	5.6Ω		30-166		Tapped @ 5Ω
L7	SW Osc. Coil	.1Ω		30-165		Tapped
L8	Input IF	14.5Ω	15Ω	30-154	BC-352	
L9	Output IF	9.5Ω	9.5Ω	30-155	BC-353	
L10	Fil. Choke	0Ω		140-109		
L11	Hash Choke	0Ω		140-110		

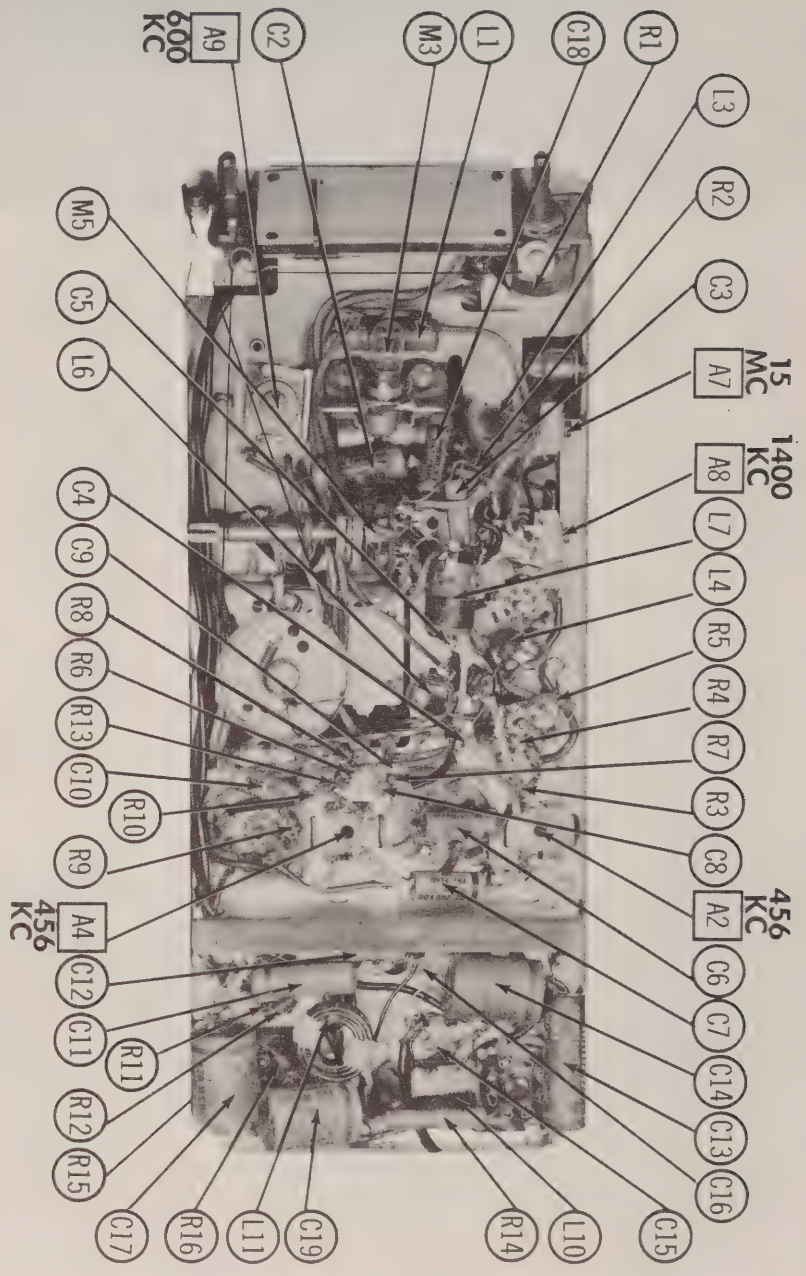
VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				REGAL PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Int.	6.3V	115	150-130	5301	859	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			REGAL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A 32V			307014 (SFE-14A)	157014	SFE-14	HDI

CHASSIS—BOTTOM VIEW



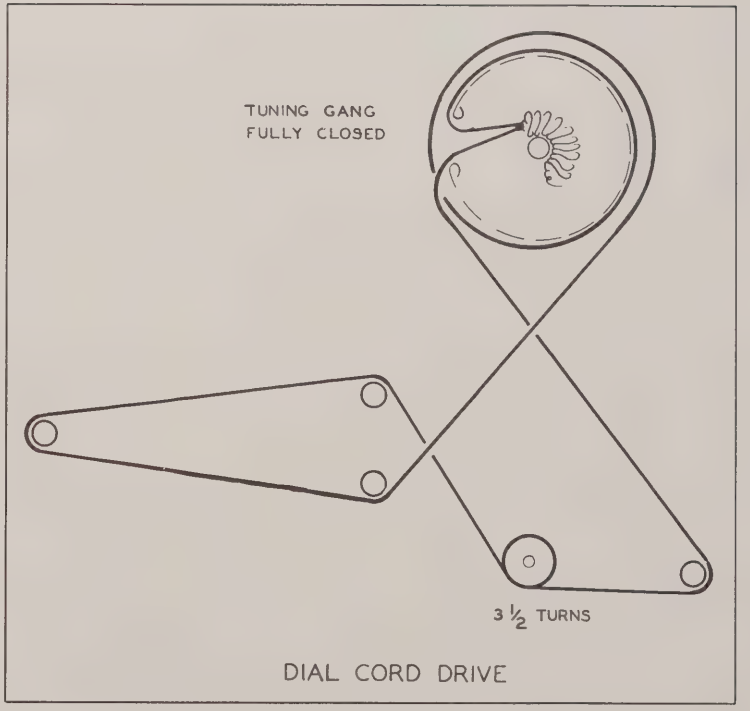
PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					REGAL PART No.		
M3	Bayonet	6-8	.15	Brown			Type #47

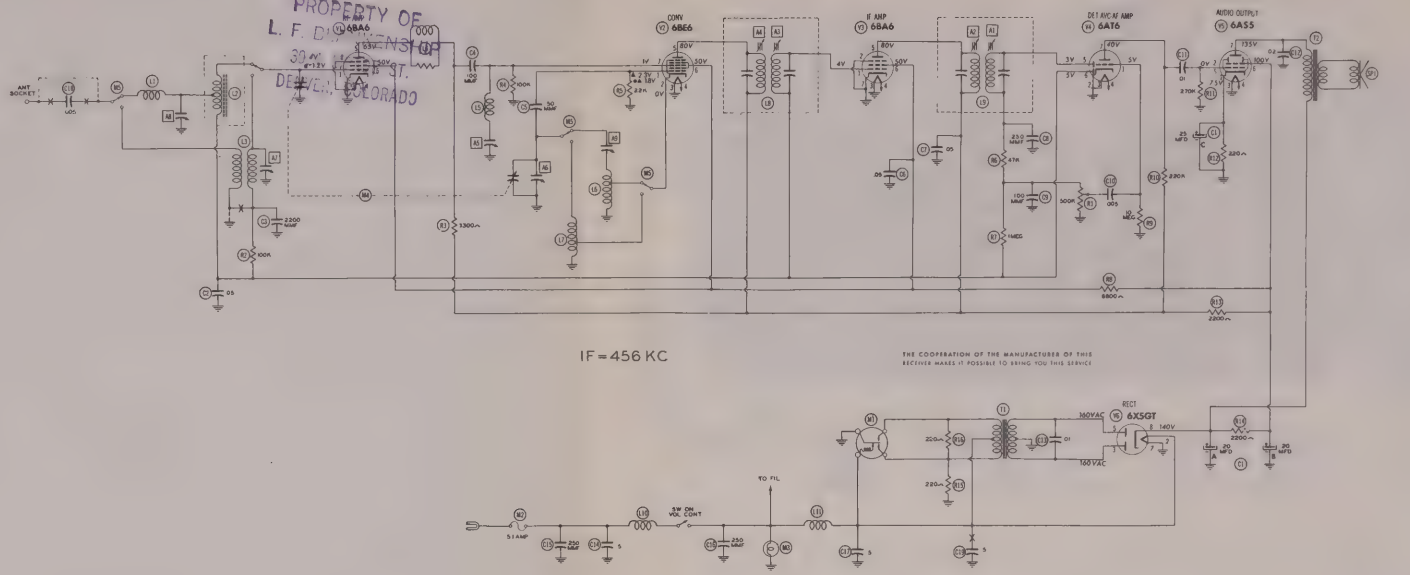
MISCELLANEOUS

ITEM No.	PART NAME	REGAL PART No.	NOTES
M4	Tuning Cap.	40-113	(12-409MMF, 12-409MMF)
M5	Switch	95-113	Band-change
A7	Trimmer	40-118	Sw. Ant. Adj.
A8	Trimmer	40-112	BC Ant. Adj.



DIAL CORD DRIVE

PROPERTY OF
L. F. DI... SHOP
30... ST.
DE... COLORADO



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	1.5Meg ■1.6Meg	0Ω	0Ω	.5Ω	†8KΩ	†9KΩ	0Ω	
V 2	6BE6	22KΩ	.6Ω ■.1Ω	0Ω	.5Ω	†4.4KΩ	†9KΩ	100KΩ	
V 3	6BA6	1.5Meg	0Ω	0Ω	.5Ω	†4.4KΩ	†9KΩ	0Ω	
V 4	6AT6	10Meg	0Ω	0Ω	.5Ω	550KΩ	1.5Meg	†225KΩ	
V 5	6AS5	220Ω	270KΩ	0Ω	.5Ω	270KΩ	†2200Ω	†200Ω	
V 6	6X5	INF	.5Ω	450Ω	INF	420Ω	420Ω	0Ω	700KΩ

ALL MEASUREMENTS TAKEN IN BROADCAST POSITION UNLESS OTHERWISE NOTED.
■ MEASURED IN SHORT-WAVE POSITION
† MEASURED FROM PIN 8 OF V6
▲ TAKEN WITH VACUUM TUBE VOLTMETER

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 8.3 Volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

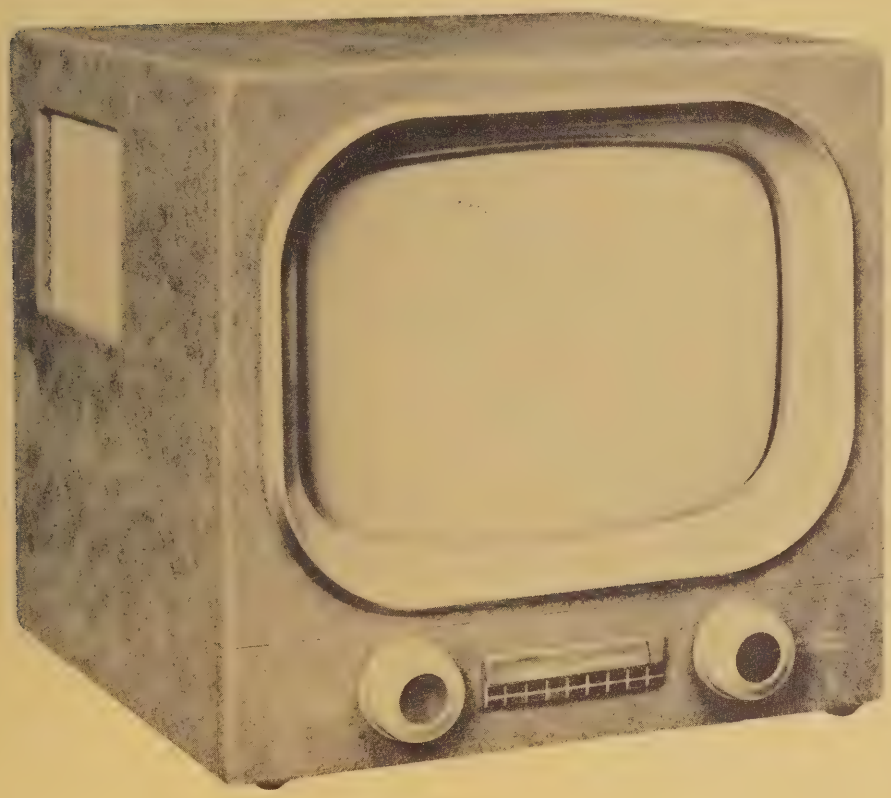
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1953

PROPERTY OF

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 317GS34C-218

WELLS GARDNER
MODELS 317GS34C-218, -220, -278

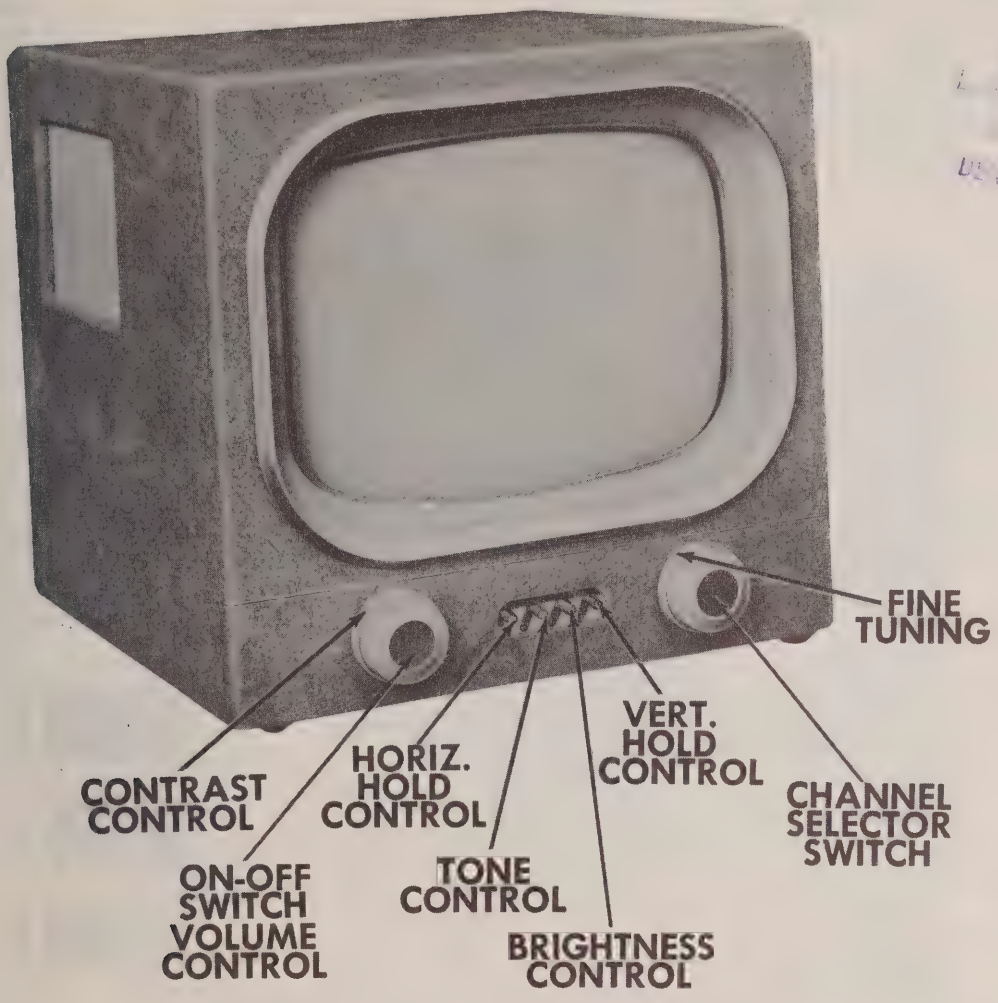
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

DATE 2-53 SET 195 FOLDER 12

WELLS GARDNER
MODELS 317GS34C-218, -220, -278

OF
SHIP
COLORADO



WELLS-GARDNER 317GS34C-218

TRADE NAME	Wells-Gardner Models 317GS34C-218, -220, -278.
MANUFACTURER	Wells-Gardner & Co., 2701 N. Kildare Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-Three

POWER SUPPLY 110-120 Volts AC - 60 cycle RATING 1.65 Amp. @ 117 Volts AC
TUNING RANGE— Channels 2 thru 13, Video IF 26.2MC, Sound IF 21.7MC (Intercarrier)

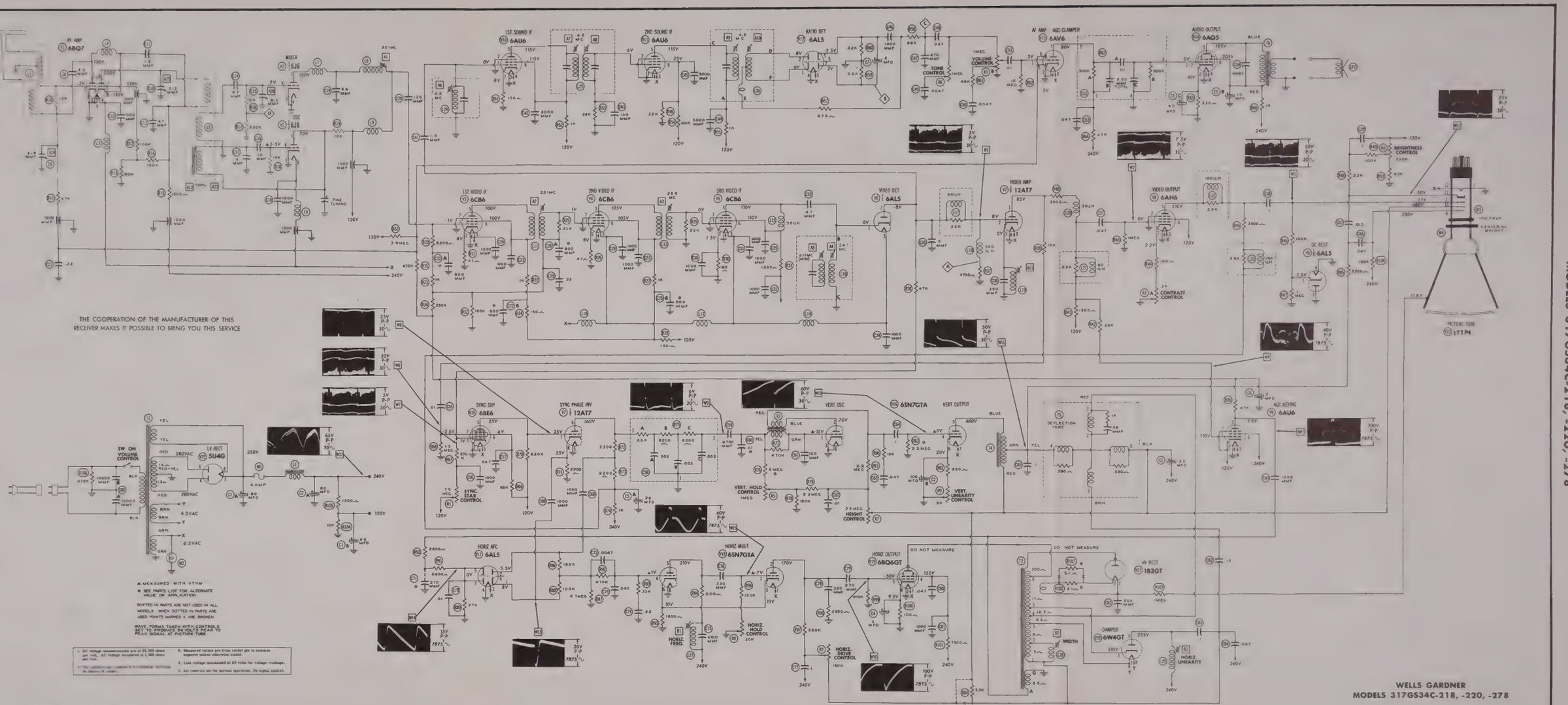
INDEX

Alignment Instructions 6, 7
Disassembly Instructions 11
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 12, 13, 14
Photographs
Cabinet - Rear View 11
Capacitor and Alignment Identification 4, 9
Chassis - Top View 3
Photographs
RF Tuner 10
Resistor and Inductor Identification 15, 16
Resistance Measurements 8
Schematic 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

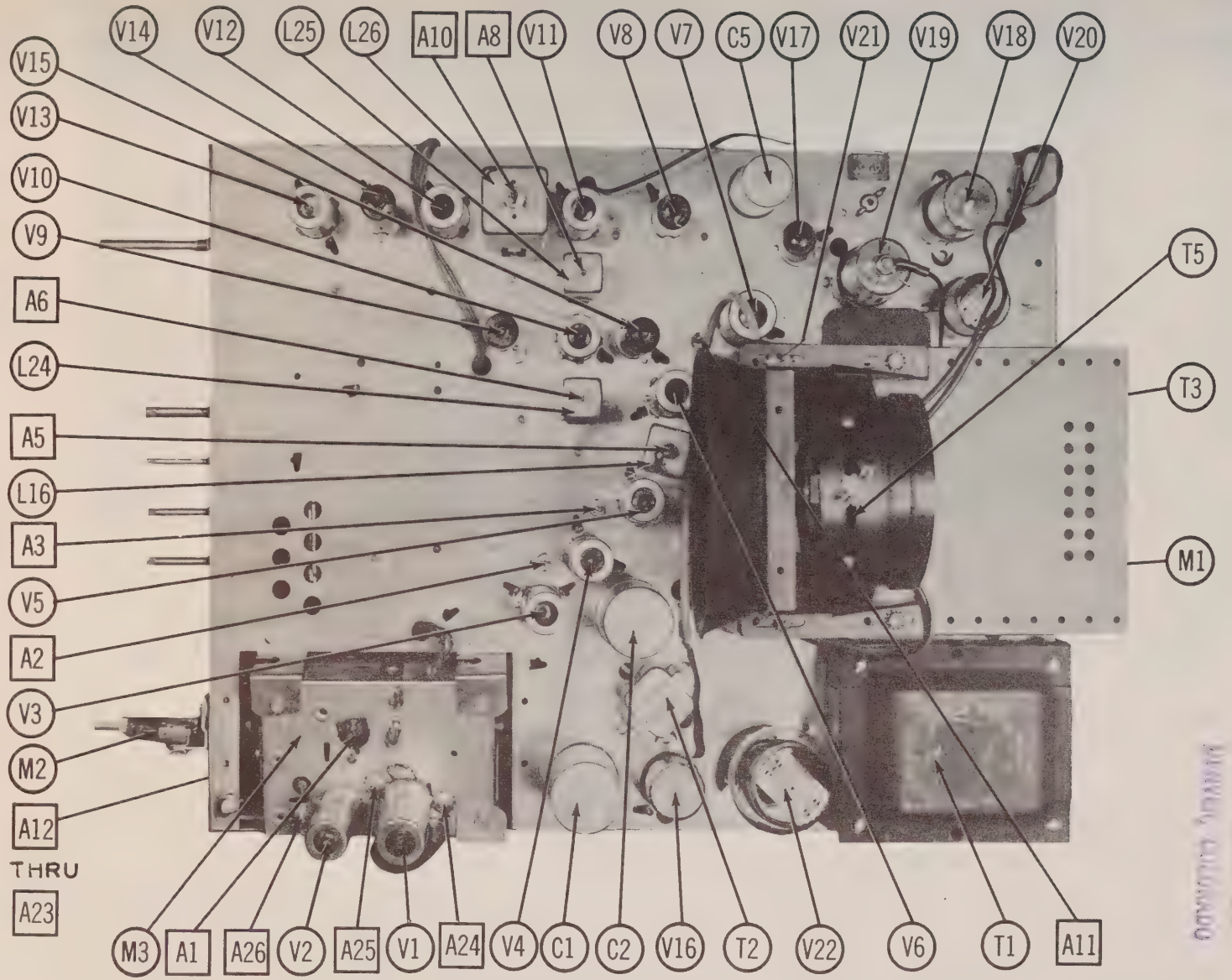
HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

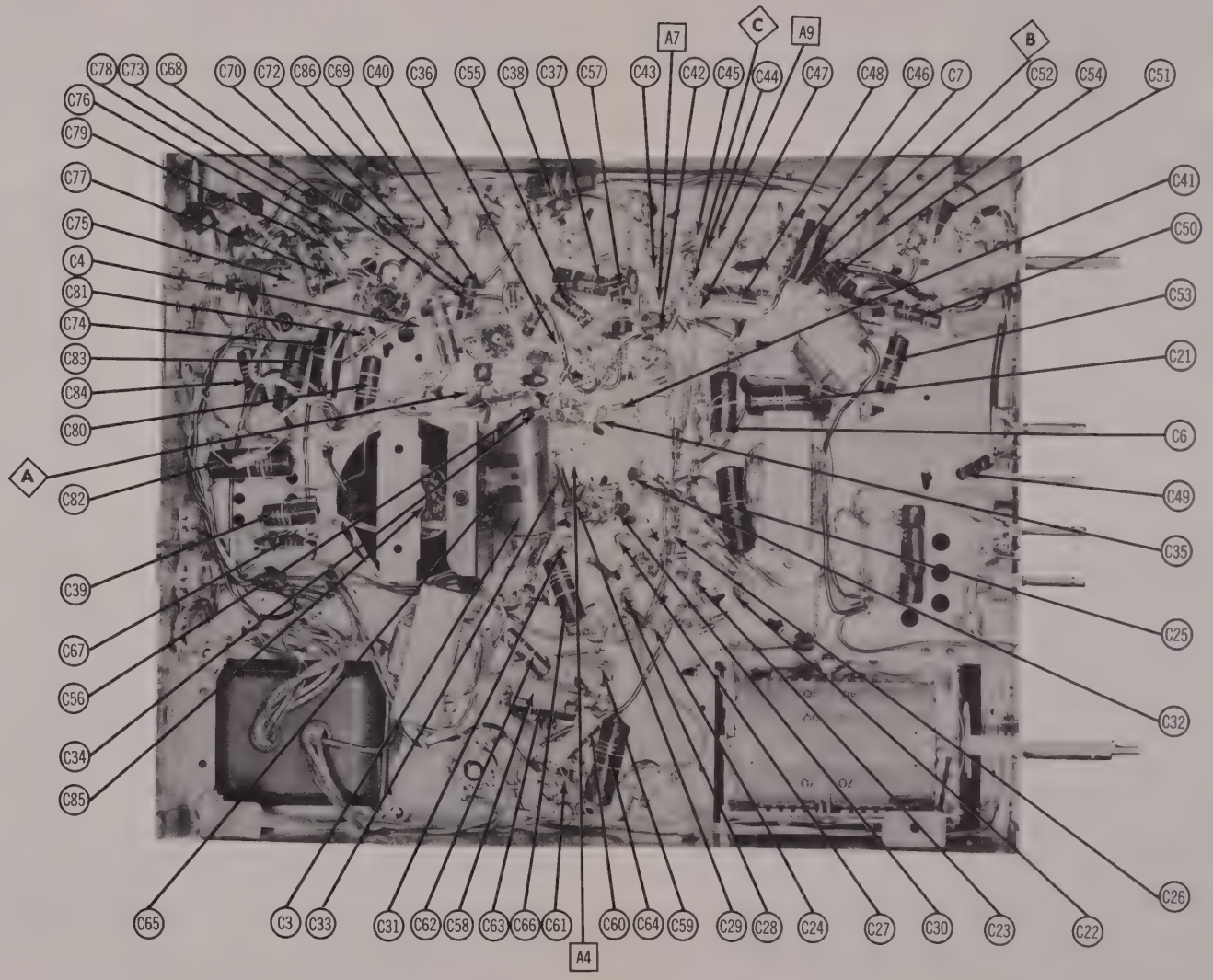
WELLS GARDNER
MODELS 317GS34C-218, -220, -278


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
RF AMP 6BQ7
MIXER 6J6
OSC 6J6
1ST SOUND IF 6AU6
2ND SOUND IF 6AU6
RATIO DET 6AL5
AF AMP AGC-CLAMPER 6AV6
AUDIO OUTPUT 6AQ5
1ST VIDEO IF 6CB6
2ND VIDEO IF 6CB6
3RD VIDEO IF 6CB6
VIDEO DET 6AL5
VIDEO AMP 12AT7
VIDEO OUTPUT 6AH6
SYNC SEP 6BE6
SYNC PHASE INV 12AT7
VERT OSC 6SN7GTA
VERT OUTPUT
HORIZ AFC 6AL5
HORIZ MULT 6SN7GTA
HORIZ OUTPUT 6BQ6GT
LV RECT 5U4G
HV RECT 1B3GT
DAMPER 6W4GT
DC REST 6AL5
AGC KEYING 6AU6
PICTURE TUBE 17TP4
TONE CONTROL
VOLUME CONTROL
BRIGHTNESS CONTROL
CONTRAST CONTROL
SYNC STAB CONTROL
VERT. HOLD CONTROL
VERT. LINEARITY CONTROL
HEIGHT CONTROL
HORIZ. HOLD CONTROL
HORIZ. DRIVE CONTROL
HORIZ. LINEARITY
WIDTH
HORIZ. FREQ.
FINE TUNING
SW ON VOLUME CONTROL
DEFLECTION YOKE
ION TRAP CENTERING MAGNET
DO NOT MEASURE
A MEASURED WITH VTVM
B SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCT DETECTOR TUNED FOR PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1952
WELLS GARDNER
MODELS 317GS34C-218, -220, -278

WELLS GARDNER
MODELS 317GS34C-218, -220, -278



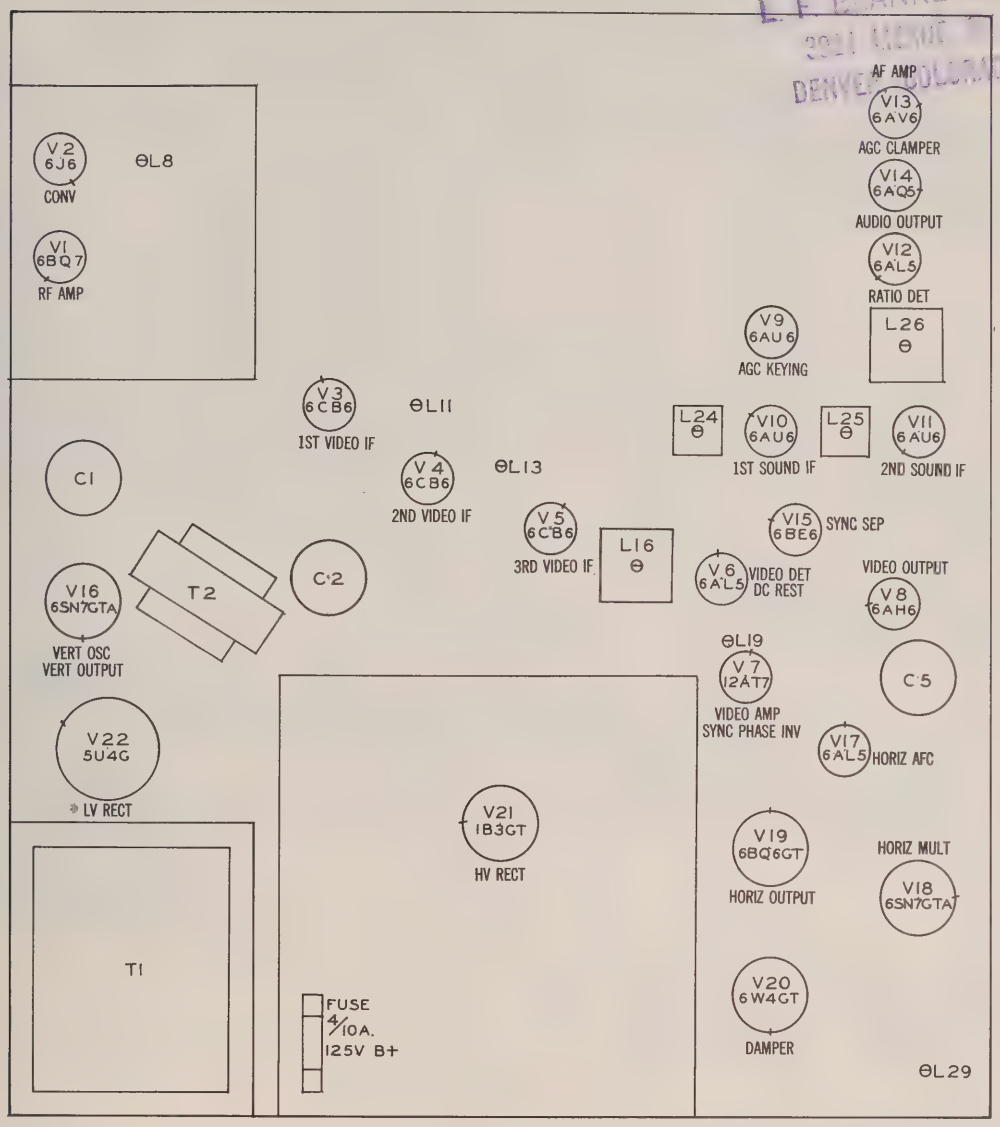
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3241 KENNEDY
DENVER, COLORADO



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, No sound - V22, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, No sound, Has raster - V2, V3, V4, V5, V6
No pic, No Sound, Has snow - V1, V2, V3
No pic, Has Sound, Has raster - V6, V7, V8, V23
Has pic, No Sound - V10, V11, V12, V13, V14
Overloaded picture - V19, V13

SYNC FAILURE
No vert. sync - V7, V16
No horiz. sync - V7, V17, V18
No vert. or horiz. sync - V7, V15

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V23
No vertical deflection - V16
Poor vert. linearity or foldover - V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22
Vert. off freq. - V16
Horiz. off freq. - V7, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube, V18.

VIDEO IF ALIGNMENT

Remove the converter tube, V2 and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C25. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, V2. Low side to chassis.	25.1MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.1MC	"	"	A2	"
3.	"	"	25.9MC	"	"	A3	"
4.	"	"	24.1MC	"	"	A4	"
5.	"	"	21.7MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, V2. Low side to chassis.	24MC (10MC Swp)	21.7MC 23MC 23.5MC 25.25MC 26.2MC	Any	Vert. amp. to point (A). Low side to chassis.		Check for response curve similar to fig.1. If necessary retouch A1 through A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD.	High side to pin 1, (cathode) of 6AL5 (V6). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point B Common to chassis.	A6, A7, A8, A9,	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point C Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation at 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (Cathode) of 6AL5 (V6). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A6, A7, A8, A9	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as in fig. 2.
8.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A10	Reconnect capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Turn contrast control to maximum clockwise position.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to pin 7 of 6AL5 (V12)	Not used.	4.5MC (400%Mod.)	Any	Vert. amp. to pin 2 of picture tube. Low side to chassis.	A11	Adjust for MINIMUM 400% indications on scope.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The oscillator adjustment screws for each channel are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A) Low side to chassis.	A12	Adjust to place sound marker in notch as in fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.74MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.25MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage form the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. thru 10K to point ◇D◇. Low side to chassis.	A24, A25 A26	Adjust for response curve similar to fig.5. with markers above 90%.
12.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to fig.5. If markers fall below 70% on any channel make slight compromise adjustments of A24, A25 and A26 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

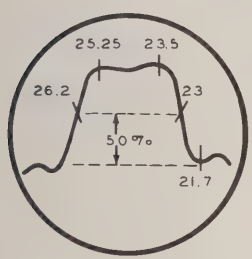


FIG. 1

FIG. 2

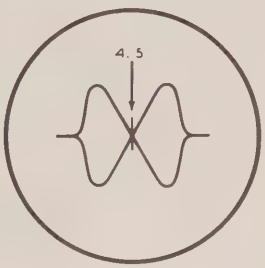


FIG. 3

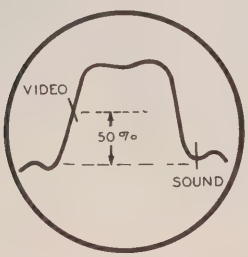


FIG.4

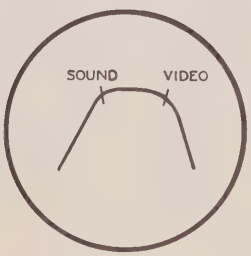
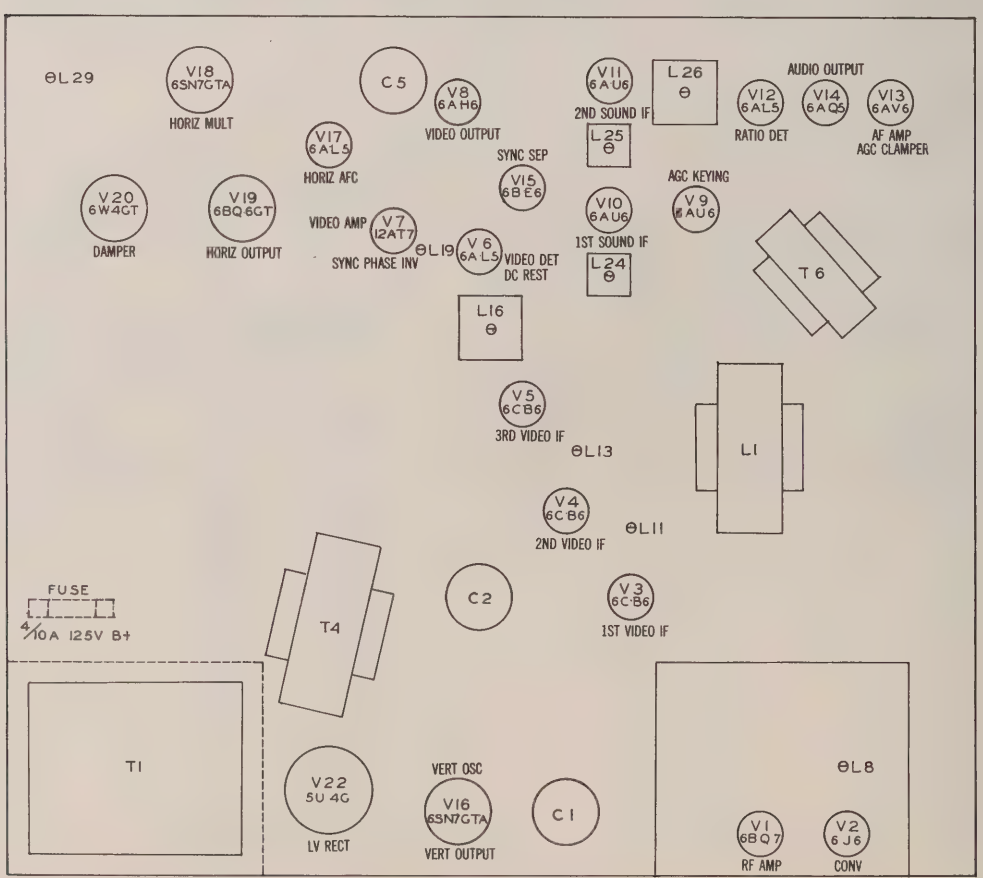


FIG.5

RESISTANCE MEASUREMENTS

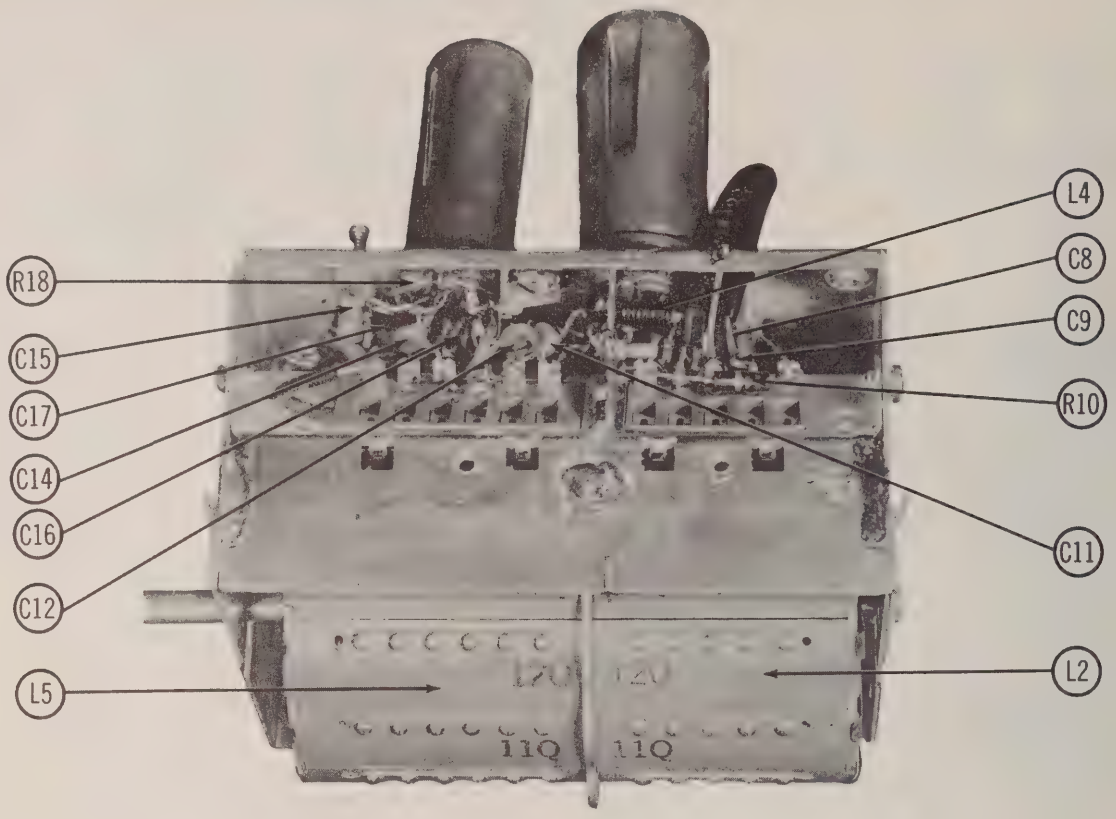
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	720KΩ	0Ω	.1Ω	0Ω	†1.5KΩ	†150KΩ	INF	0Ω
V 2	6J6	†11KΩ	†1.5KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	110KΩ	47Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 4	6CB6	100KΩ	47Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 5	6CB6	.3Ω	180Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 6	6AL5	.3Ω	0Ω	.1Ω	0Ω	1 Meg	0Ω	4.7KΩ		
V 7	12AT7	†8.6KΩ	4.7KΩ	.2Ω	0Ω	0Ω	†6.5KΩ	†820KΩ	2.2KΩ	.1Ω
V 8	6AH6	1 Meg	0Ω	.1Ω	0Ω	†4.9KΩ	†15KΩ	250Ω		
V 9	6AU6	†36KΩ	†1.5KΩ	.1Ω	0Ω	440KΩ	†51Ω	†1.5KΩ		
V 10	6AU6	2.6Ω	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	100Ω		
V 11	6AU6	56KΩ	0Ω	.1Ω	0Ω	†2.5KΩ	25KΩ	0Ω		
V 12	6AL5	INF	INF	.1Ω	0Ω	22KΩ	INF	22KΩ		
V 13	6AV6	10Meg	0Ω	.1Ω	0Ω	670KΩ	670KΩ	†550KΩ		
V 14	6AQ5	500KΩ	330Ω	0Ω	.1Ω	†1.5KΩ	†1KΩ	500KΩ		
V 15	6BE6	51KΩ	0Ω	.1Ω	0Ω	†820KΩ	†69KΩ	1.5Meg		
V 16	6SN7GTA	2.3Meg	#2.7Meg	0Ω	2.2Meg	#4.8KΩ	2.1KΩ	.1Ω	0Ω	
V 17	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	8.7KΩ	INF	8.7KΩ		
V 18	6SN7GTA	180KΩ	#300KΩ	1.8KΩ	5.1Meg	†5.2KΩ	1.8KΩ	.1Ω	0Ω	
V 19	6BQ6GT	5.7KΩ	0Ω	INF	†7.5KΩ	470KΩ	#80KΩ	.1Ω	100Ω	TopCap #17Ω
V 20	6W4GT	†51Ω	†100KΩ	300KΩ	5.1Meg	†66Ω	†51Ω	#21Ω	#21Ω	
V 21	1B3GT	PINS 1-8 HAVE INF RESISTANCE								TopCap #31 7Ω
V 22	5U4G	INF	9.5KΩ	INF	15.6Ω	1.3KΩ	14.4Ω	INF	9.5KΩ	
V 23	17TP4	0Ω	1.1Meg	Pin 6 †100KΩ	Pin 10 #3.3KΩ	Pin 11 †270KΩ	Pin 12 .1Ω			

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 2 OF V22
# MEASURED FROM PIN 3 OF V20

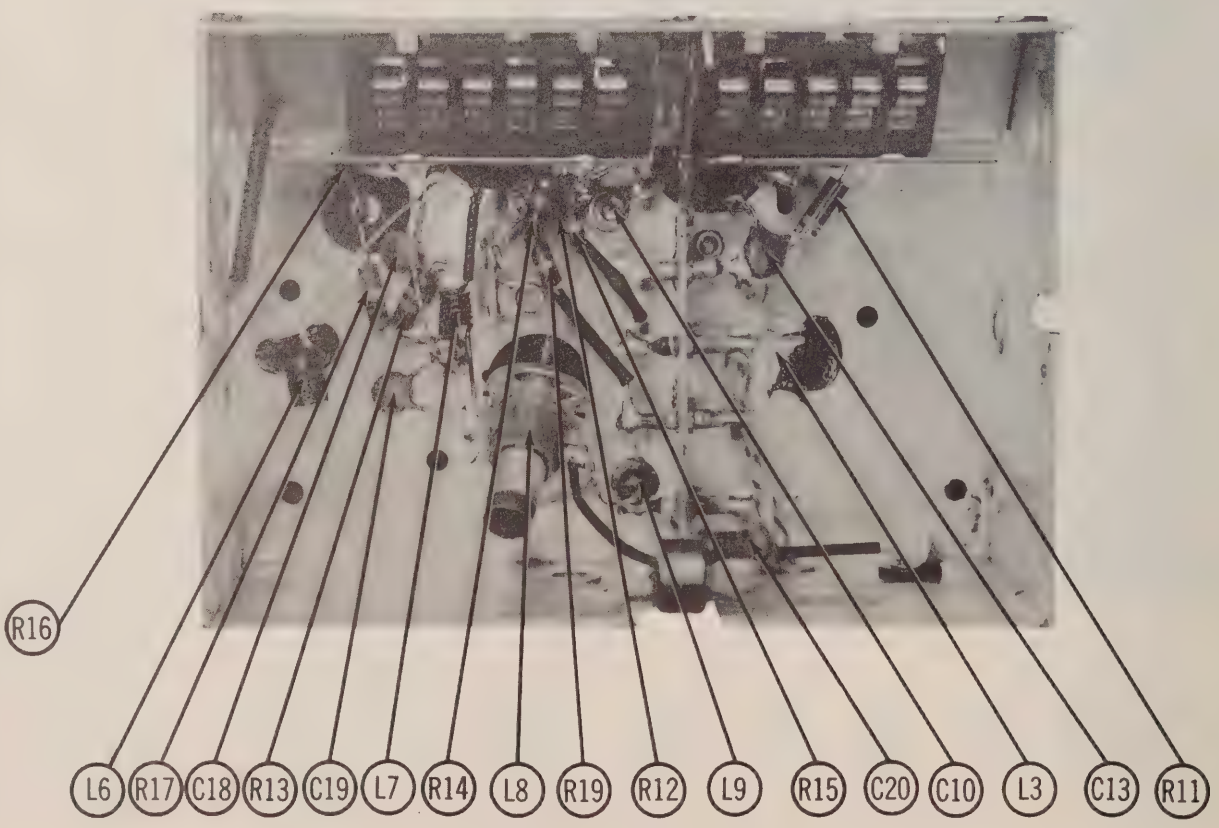


BOTTOM VIEW

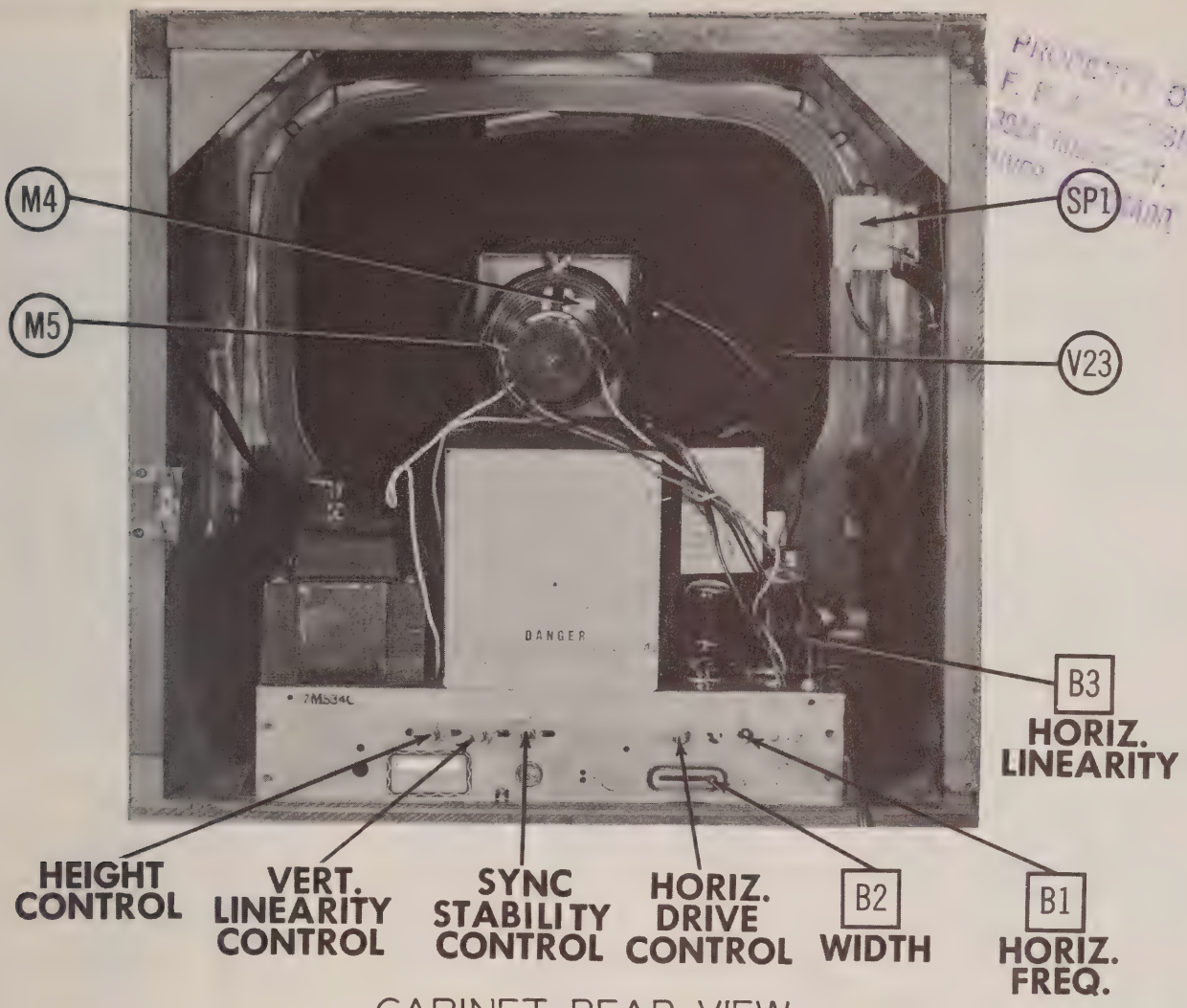
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the center of its range and adjust the horizontal frequency slug (B1) until the picture falls into sync.

Adjust the horizontal drive control for the best compromise between brightness and linearity.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for picture that is symmetrical from left to right.

SYNC STABILITY CONTROL ADJUSTMENT

Tune set to strongest TV signal available.

Turn the sync stability control clockwise until bending of the picture occurs at the top, then turn counter clockwise until the bending just disappears.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 2 wood screws and 2 metal screws. Remove rear cover.
3. Disconnect built-in antenna and speaker.
4. Remove 2 wood screws. Remove antenna bracket.
5. Remove 4 speaker nuts. Remove speaker.
6. Remove 5 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	[illegible]	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector - DC Restorer	6AL5	6AL5	5BT	
V7	Video Amplifier - Sync Phase Inv.	12AT7	12AT7	9A	
V8	Video Output	6AH6	6AH6	7BK	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st. Sound IF Amp.	6AU8	6AU6	7BK	
V11	2nd. Sound IF Amp.	6AU8	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier - AGC Clamper	[illegible]	6AV6	7BT	
V14	Audio Output	6AQ5	6AQ5	7BT	
V15	Sync Separator	6BE6	6BE6	7CH	
V16	Vert. Oscillator - Vert. Output	6SN7GTA	6SN7GTA	8BD	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V20	Damper	6W4GT	6W4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: SYLVANIA Part No.	RTMA BASE TYPE	NOTES
V23	17TP4	17TP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: SPRAGUE Part No.	NOTES
C1A	±80	300	45X397	AFH3-46		UPT84245		FP227.6	TVL-3642	
B	±60	300								
C2A	±80	300	45X395	AFH3-199		UPT4445-V10		FP375	TVL-3722	
B	±100	50								
C3	30	400	45X39 3	PR8450/30		BR3045A		TC77	TVA-1711	
C4	5	25	45X378	PR8150/4		BR550		TC30	TVA-1203	
C5A	±20	300	45X399	AFH3-138		UPT2145-V5		FP366	TVL-3751	
B	±10	300								
C	40	50								
C6	5	25	45X361	PR8150/4		BR550		TC30	TVA-1203	
C7	5	25	45X378	PR8150/4		BR550	NP0K-2R2	TC30	TVL-1203 TVA-1203	
C8	2.2				TCZ-2.2				5TCCB-V22	
C9	3-9				829-10					
C10	.5-3				829-3		CT565A			
C11	1.5			SII.5NP0	TCZ-1.5		NP0K-1R5	ZT5515	5TCCB-V15	
C12	47			SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C13	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C14	47			SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C15	.5-3				829-3		CT565A			
C16	10			SII0NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C17	5			SI5N750			N750K-050	NT-555	5 tCUB-V5	
C18	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C19	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCB-V68	
C20	120			SI120	D6-121	TM5T11	GP2K-121	UC-5312	5GA-T12	
C21	22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C22A	800			BPD-2X001		TM5DD1	812-001	DCD-521	5HK-2D1	Note 1
B	800									Note 1
C23	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C24	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C25	22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C26A	800			BPD-2X001		TM5DD1	812-001	DCD-521	5HK-2D1	Note 1
B	800									Note 1
C27	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C28	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C29	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C30	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C32	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C33	47		47X803	SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C34	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	5		47X562	SI5N5P0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C36	360	500	47X568							
C37	.047	400	RCP10M4473M	P488-047		DF-503	PTE4S47		PT4147	4TM-S47
C38	.1	400	RCP10M4104M	P488-1		DF-104	PTE4P1		PT401	4TM-P1
C39	.1	200	RCP10M2104M	P288-1		DF-104	PJ2P1		PT401	2TM-P1
C40	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C41	1.5		47X584	SII.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C42	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C43	100		47X804	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C44	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C45	5000		47X507	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C46	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C47	470	500	47X525	D6-471		5WST5	GP2K-471	MC245	1FM-35	
C48	.047	200	RCP10M2473M	P288-047		DF-503	PTE4S47		PT4147	2TM-S47
C49	.0047	400	RCP10M4472M	P688-0047		D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47
C50	.0047	400	RCP10M4472M	P688-0047		D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47
C51	.01	400	RCP10M4103M	P488-01		D6-103	PTE4S1	GP2-333-103	PT4I1	4TM-S1
C52A	.01									
B	250		↑76X5			↑PC-80		↑404-01		
C										
C53	.047	400	RCP10M4473M	P488-047		DF-503	PTE4147		PT4147	4TM-S47

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: AEROVOX Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: CORNELL-DUBILIER Part No.	REPLACEMENT DATA: ERIE Part No.	REPLACEMENT DATA: MALLORY Part No.	REPLACEMENT DATA: SPRAGUE Part No.	NOTES
C54	.0047	600	RCP10M6472M	P686-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C55	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT4I1	4TM-S1	
C56	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C57	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C58A	.002			P688-002		PTE6D5		PT625		
B	.005		↑76X7	P688-005	↑PC-100	PTE6D5	↑404-05-01	PT625	↑401C1	
C	.005			P688-005		PTE6D5		PT625		
C59	4700	500	47X543	1464-005		1DR5D5		MC8465	MS-25	
C60	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT4I1	4TM-S1	Note 2
C61	100		47X603	SI100	D6-101	TM5T1	GP1K-101	DC-531	5GA-T1	
C62	01	600	RCP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	PT6I1	6TM-S1	
C63	.047	600	RCP10M6473M	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C64	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C65	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT6147	61tf-S47	
C66	.047	600	RCP10M6473M	P688-005	DF-503	PTE6S47		PT6147	6TM-S47	
C67	.015	600	RCP10M6153M	P688-015		PTE6S15		PT615	6TM-S15	
C68	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C69	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C70	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT4I1	4TM-S1	
C71	270	500	RCM20A271K	1469-0003		5RST3		MCB241	MS-33	Note 3
C72	.0047	400	RCP10M4472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C73	.047	200	RCP10M2473M	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C74	22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C75	4700	500	47X543	1464-005		1DR5D5		MC8465	MS-25	
C76	330	500	47X570	1469-00035						
C77	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C78	330	500	47X570	1469-00035						
C79	270	500	RCM20A271K	1469-0003		5RST3		MCB241	MS-33	
C80	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C81	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C82	.15	400	RCP10M4154M	P488-15		PTE4P15		PT401	4TM-P15	
C83	.1	400	RCP10M4104M	P488-1		PTE4P1		PT401	4TM-P1	
C84	.047	400	RCP10M4473M	P488-047		PTE4S47		PT4147	4TM-S47	
C85	500	20000	47X560	HV20C	TV3-502	MM-C20TF3	413-501		20DK-T5	
C86A	10000		76X6	BPD-01	DD-3-103	TM5D5I	821-01	DC-511	5HK-B1	
B	10000			BPD-01			821-01	DC-511		

Note 1. Some Models use 1000MMF in this application (Part #80X3 for dual unit)
Note 2. Some Models use .0047MFD in this application (Part #RCP10M4472M)
Note 3. Not used in all Models.
* Items C58A, C58B, C58C, R75A, R75B, R75C are combined in one unit.
† Items C52A, C52B, C52C, R63A, R63B are combined in one unit. When replacing Items seperately, C52B and C52C should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: [illegible] Part No.	REPLACEMENT DATA: CLAROSTAT Part No.	REPLACEMENT DATA: CENTRALAB Part No.	REPLACEMENT DATA: MALLORY Part No.	INSTALLATION NOTES
R1	7.5Meg		40X363					Sync Stability
R2A	150KΩ		B40X331A	Q11-228	AG-52-8	AB-46	U-43	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FK5-1/4	AK-1	Not Req.	Attach to R2A
R3A	3000Ω		78X8	Q7-252 *	RTV-216	SBBT-503-S1	UF33L Volume-Tapped @ 220KΩ-Rear	Contrast-Panel
B	1 Meg						UR16-T25	Attach to R3B
C	Switch						US-26	Brightness
R4A	500KΩ		40X290D	Q11-133	AG-58-8	AB-59	U-50	Attach to R4A
B	Shaft		Not Req.	Not Req.	RS-3/16	AK-4	Not Req.	Tone
R5A	1 Meg		[illegible]	Q11-137	AG-61-8	AB-69	U-54	Attach to R5A
B	Shaft		Not Req.	Not Req.	RS-3/16	AK-4	Not Req.	Height
R6A	1 Meg		40X291E	Q11-137	AG-61-8	AB-69	U-54	Attach to R6A
B	Shaft		Not Req.	Not Req.	RS-3/16	AK-4	Not Req.	Vert Hold
R7A	2.5Meg		B40X364	Q11-239	AG-84-8	AB-83	SU-565	Attach to R7A
B	Shaft		Not Req.	Not Req.	FK5-1/4	AK-1	Not Req.	Horiz. Hold
R8A	50KΩ		40X292A	Q11-113	AG-44-8	AB-31	U-35	Attach to R8A
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Vert Linearity
R9A	8000Ω		40X362	Q11-116	AG-27-8	AB-14	SU-20	Attach to R9A
B	Shaft		Not Req.	Not Req.	FK5-1/4	AK-1	Not Req.	

CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B17-112 & P1-204 (Panel) B13-187X & R2-216 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R10	15KΩ				
R11	47KΩ				
R12	100KΩ				
R13	160KΩ-5%				
R14	100KΩ-5%				
R15	1500Ω			BTS-1500	
R16	10KΩ			BTS-10K	
R17	220KΩ			BTS-10K	
R18	10KΩ			BTS-10K	
R19	10KΩ				
R20	8200Ω		B83822		
R21	47Ω		B83470		
R22	1000Ω		B85102	BTS-1000	
R23	1900Ω		B85102	BTS-1000	
R24	150Ω		B85151	BTS-150	
R25	22KΩ		B83223		
R26	47Ω		B83470		
R27	1000Ω		B85102	BTS-1000	
R28	150Ω		B85151	BTS-150	
R29	22KΩ		B83223		
R30	180Ω		B84181	BTS-180	
R31	1500Ω		B84152	BTS-1500	
R32	100KΩ		B84104	BTS-100K	
R33	3.9Meg-5%		B83395	BTS-3.9Meg-5%	
R34	330KΩ 5%		B83334	BTS-330K-5%	
R35	470KΩ		B84474	BTS-470K	
R36	47KΩ		B84473	BTS-47K	
R37	4700Ω-5%		B83472	BTS-4700-5%	
R38	47KΩ		B84473	BTS-47K	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R39	10KΩ		B84103	BTS-10K	
R40	5600Ω		B84563	BTA-5600	
R41	1500Ω		B84152	BTS-1500	
R42	33KΩ		B84333	BTS-33K	
R43	1 Meg		B84105	BTS-1 Meg	
R44	100Ω		B84101	BTS-100	
R45	3900Ω-5%			BTA-3900-5%	
R46	100KΩ		B85104	BTS-100K	
R47	1 Meg		B84105	BTS-1 Meg	
R48	22KΩ		B84223	BTS-22K	
R49	100KΩ		B85104	BTS-100K	
R50	47KΩ		B85473	BTS-47K	
R51	100Ω		B84101	BTS-100	
R52	1000Ω		B85102	BTS-1000	
R53	56KΩ		B84563		
R54	100KΩ		B84104		
R55	1000Ω		B85102	BTS-1000	
R56	33KΩ		B84333	BTS-33K	
R57	270Ω		B84271	BTS-270	
R58	68KΩ		B84683	BTS-68K	
R59	22KΩ		B84223	BTS-22K	
R60	22KΩ		B84223	BTS-22K	
R61	68KΩ		B84683	BTS-68K	
R62	10Meg		B84106	BTS-10Meg	
R63A	500KΩ		↑76X5		
B	500KΩ				
R64	47KΩ	1	B85473	BTS-47K	
R65	330Ω	1	C84331	BTA-330	
R66	1000Ω	2	B84102	BTB-1000	
R67	27.0KΩ	1	B84274	BTS-270K	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: IRC Part No.	NOTES
R68	100KΩ	1	B84104	BTS-100K	
R69	68KΩ	1	B84683	BTS-68K	
R70	820KΩ	1	B84824	BTS-820K	
R71	2200Ω-5%	1	B83222	BTS-2200-5%	
R72	3300Ω	1	B84332	BTS-3300	
R73	2200Ω-5%	1	B83222	BTS-2200-5%	
R74	1000Ω	1	C84102	BTA-1000	
R75A	22KΩ	1		BTS-22K	
B	8200Ω		↑76X7	BTS-8200	
C	8200Ω			BTS-8200	
R76	2 Meg-5%	1		BTS-2Meg-5%	Note 1
R77	470KΩ	1	B85474	BTS-470K	
R78	180KΩ	1	B84184	BTS-180K	
R79	2.2Meg	1	B84225	BTS-2.2Meg	
R80	10KΩ	1	B84103	BTS-10K	
R81	2.2Meg	1	B84225	BTS-2.2Meg	
R82	820Ω	1	B84821	BTS-820	
R83	2.2Meg	1	B84225	BTS-2.2Meg	Note 3
R84	330Ω	1	C84332	BTA-3300	
R85	220Ω	1	B84222	BTS-2200	
R86	100KΩ	1	B84104	BTS-100K	
R87	4.7Meg	1	B85475	BTS-4.7Meg	

† Items R63A, R63B, C52A, C52B, C52C are combined in one unit.
* Items R75A, R75B, R75C, C58A, C58B, C58C are combined in one unit.
Note 1. Some models use a 1.5Meg resistor in this application.
Note 2. Some models use a 1Meg resistor in this application.
Note 3. Some models use a 3.3Ω resistor in this application.
Note 4. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: STANCOR Part No.	REPLACEMENT DATA: MERIT Part No.	REPLACEMENT DATA: CHICAGO Part No.	REPLACEMENT DATA: TRIAD Part No.
T1	117VAC	555VCT @ 1.65A	5VAC @ 3A	6.3VAC @ 6.3A; SEC. 4 6.3VAC @ 2A	53X325	P8167			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: STANCOR Part No.	REPLACEMENT DATA: MERIT Part No.	REPLACEMENT DATA: CHICAGO Part No.	REPLACEMENT DATA: TRIAD Part No.	NOTES
T2	190Ω	400Ω - 8.5Ω	54X8	A-8125	A-3000 ↓	TBO-2 ↓	A-47X	Vert. Osc. Trans. Horiz. Output Trans.
T3	346.5Ω @ 5Ω; tap @ 5Ω; 8.5Ω	SEC. 2 @ 00	53X328 @ 53X326 @					
T4	46.5Ω; 150Ω; tap @ 4.5Ω	20Ω	51X156	A-8141	A-3039		A-104X	Vert. Output Trans.
T5A	20Ω		9A2261	DY-9	MDF-70	TY-3	Y-17	Horiz. Deflection Coils
B	50Ω		9A2255 ↓					Vert. Deflection Coils

1. Drill one new mtg. hole.
2. Mount on top of chassis.
3. Alternate Horiz. Output Trans.
4. Alternate deflection yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE	RATING: DC RES PRI.	RATING: DC RES SEC.	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: STANCOR Part No.	REPLACEMENT DATA: MERIT Part No.	REPLACEMENT DATA: CHICAGO Part No.	REPLACEMENT DATA: TRIAD Part No.	NOTES
T6	1.9KΩ	3.7Ω	485Ω	.95Ω 51X150A	A-3330	A-2998	RO-2	S-2X	

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V C	RATINGS: IMP	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: JENSEN Part No.	REPLACEMENT DATA: QUAM Part No.	NOTES
SP1	6	PM	3	7	12AS04	ST-108 Mod. P6 X	6A1	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D C RESISTANCE	RATINGS: INDUCTANCE @ CURRENT 1000 (Ω)	REPLACEMENT DATA: Wells-Gardner Part No.	REPLACEMENT DATA: STANCOR Part No.	REPLACEMENT DATA: MERIT Part No.	REPLACEMENT DATA: CHICAGO Part No.	REPLACEMENT DATA: TRIAD Part No.
L1	240	51	1.6 Hy.	52X90	C-2325 ①	C-4491 ↓	TR-1733	C-17X ↓

1. Drill one new mtg. hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Wells-Gardner PART No.	MERIT PART No.	
L2	Ant. Coils	0Ω	0Ω			
L3	Fil. Choke	0Ω				
L4	RF Choke	0Ω				
L5	RF Mixer Grid & Osc.	0Ω				
L6	Coils					
L6	Fil Choke	0Ω				
L7	RF Choke	0Ω				
L8	1st. Video IF	.8Ω				
L9	RF Choke	1.1Ω				
L10	Fil Choke	0Ω		9A2033		
L11	2nd Video IF	.3Ω	.3Ω	9A2230		
L12	Fil Choke	0Ω		9A2033		
L13	3rd Video IF	.3Ω	.3Ω	9A2230		
L14	Fil Choke	0Ω		9A2033		
L15	RF Choke	2.5Ω		9A1979	TV-180	36 Microheneries
L16	4th Video IF	.3Ω		9A2226	TV-101	Includes Trap
L17	Series Peaking Coil	7.5Ω		36A10	TV-181 *	60 Microheneries Wound on 22K resistor
L18	Shunt Peaking Coil	26Ω		36A11	TV-188	500 Microheneries
L19	4.5MC Trap	.2Ω		9A2074	TV-151	
L20	Series Peaking Coil	2.5Ω		9A1979	TV-180	36 Microheneries
L21	Shunt Peaking Coil	7.5Ω		36A10	TV-181 *	60 Microheneries Wound on 22K resistor
L22	Series Peaking Coil	13Ω		36A12	TV-184 *	160 Microheneries Wound on 22K resistor
L23	Series Peaking Coil	14Ω		36A13	TV-184 †	190 Microheneries Wound on 3.9K resistor
L24	1st Sound IF	2.6Ω		9A2168		
L25	2nd Sound IF	1.8Ω	1.8Ω	9A2170	TV-113	
L26	Ratio Det.	3.6Ω	.8Ω CT	9A2269	TV-110 ■	Tertiary Winding .2Ω
L27	Horiz. Osc.	47Ω		9A2096	TV-163	
L28	Width Coil	.6Ω		9A2183	MWC-2	
L29	Horiz. Lin.	.5Ω		9A2262		

* Parallel with 22K resistor.
† Parallel with 3.9K resistor.
■ Drill one new mtg. hole.

FUSES

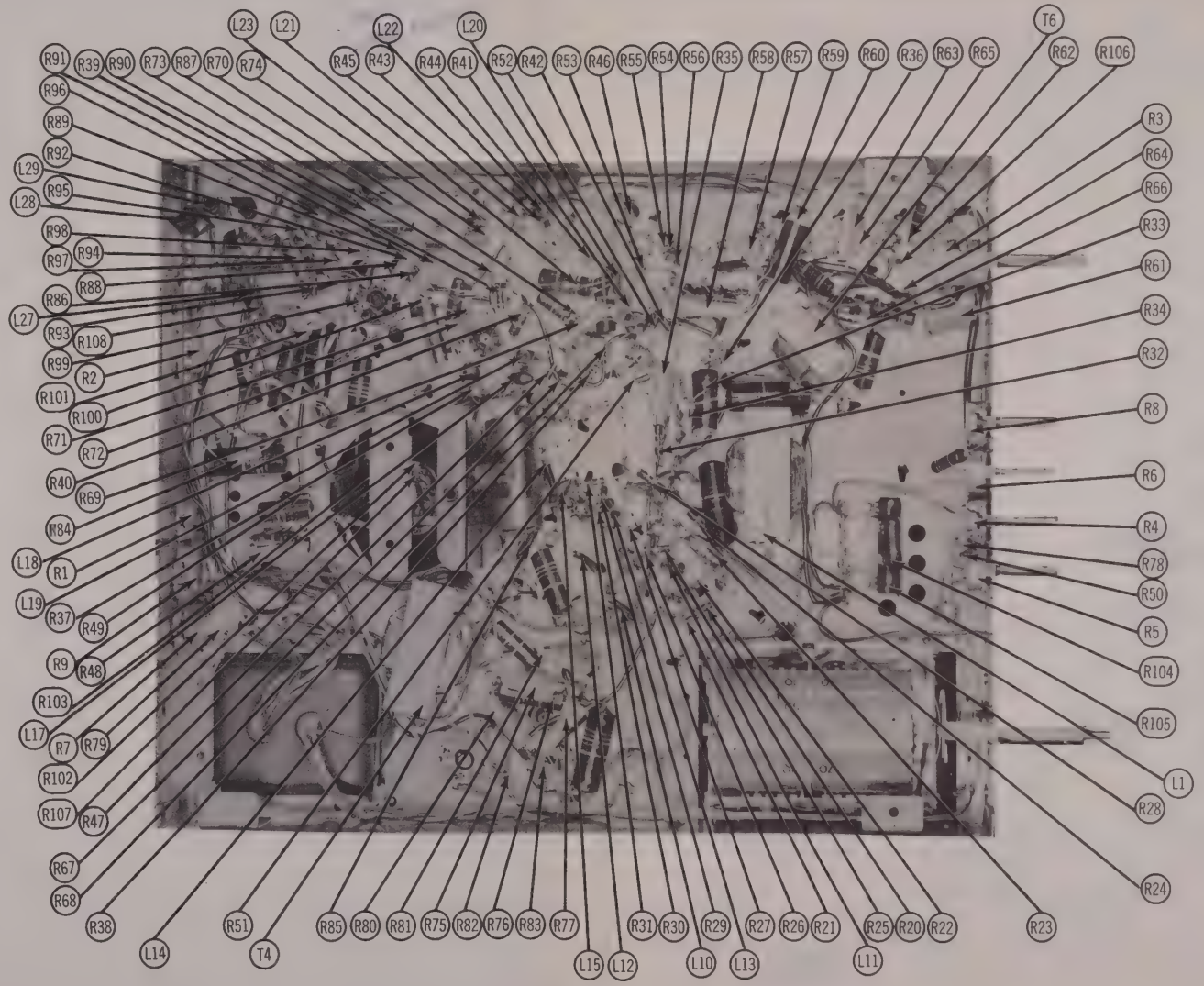
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Wells-Gardner PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	4/10A 125V	16X147-3	16X146	313.400	357001	MDL-4/10	4405

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Wells-Gardner PART No.		
M2	Bayonet	7.5	.2	White	7A32		Type No. # 51

MISCELLANEOUS

ITEM No.	PART NAME	Wells-Gardner PART No.	NOTES
M3	RF Tuner	25A1094	
M4	Centering Magnet	2A419	
M5	Ion Trap	2A421	
	Knob	10A779	Off/On Volume
	Knob	10A785	Fine Tuning
	Knob	10A786	Contrast
	Knob	10A812	Channel Selector
	Escutcheon	4X1184	Control Panel
	Mask	4X1190	
	Back Cover	S-14X59	Includes line cord assembly
	Safety Glass	17X168	

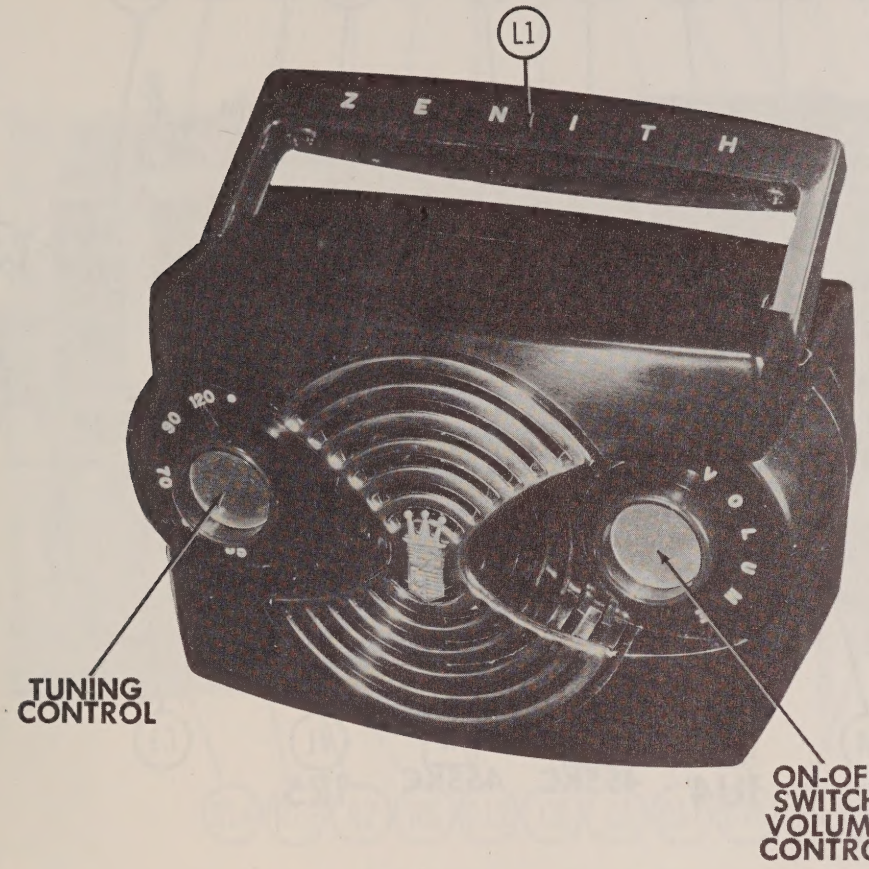


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

RTMA RADIO-TELEVISION MANUFACTURERS ASSOCIATION MEMBER

ZENITH
MODELS K412G, R, W, Y (Ch. 4K01)

ZENITH
MODELS K412G, R, W, Y (Ch. 4K01)



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ZENITH
MODELS K412G, R, W, Y (Ch. 4K01)

TRADE NAME	Zenith Models K412G, R, W, Y (Ch. 4K01)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC/DC
RATING	.10 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator plates of antenna section of tuning gang. Low side to B-.	455KC (400%Mod)	600KC	Across voice coil	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1600 KC	1600 KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400 KC	Tune to 1400 KC signal	"	A6	"

After alignment has been completed replace chassis in cabinet, turn tuning gang fully open and set pointer at index dot at high frequency end of dial.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
"Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ZENITH
MODEL K412G (Ch. 4K01)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■80	150	22-2426	E3C423					R1282	
B	▲20	150								
C	200	10								
C2	.022	400	22-2074	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C3	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	DC-524	5HK-D4	
C4	.1	200	22-1777	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C5	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C6	.0033	400	22-2226							
C7	110		22-5	SI110						
C8	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C9A	100		♦105-31	SI100	♦PC-91	TM5T1	♦1407-03	UC-531	♦103C3	
B	.005			BPD-005		TM5D5		DC-525		
C	.005			BPD-005		TM5D5		DC-525		
C10	.01	400	22-1846	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C11	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C12	.047	400	22-1775	E3C423		PJ4S47		PT4147	4TM-S47	

♦ Items C9A, C9B, C9C, R11A, R11B, R11C are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	63-2820	Q13-137	AG-63-Z	AB-70	U-53	Volume
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R2	100KΩ	½	63-1870	BTS-100K	
R3	2200Ω	½	63-1800		
R4	1Meg	½	63-1912	BTS-1Meg	
R5	270Ω	½	63-1761	BTS-270	
R6	1000Ω	½	63-1786	BTS-1000	
R7	4.7Meg	½	63-1940	BTS-4.7Meg	
R8	15Meg	½	63-1961	BTS-15Meg	
R9	470Ω	½	63-1771	BTS-470	

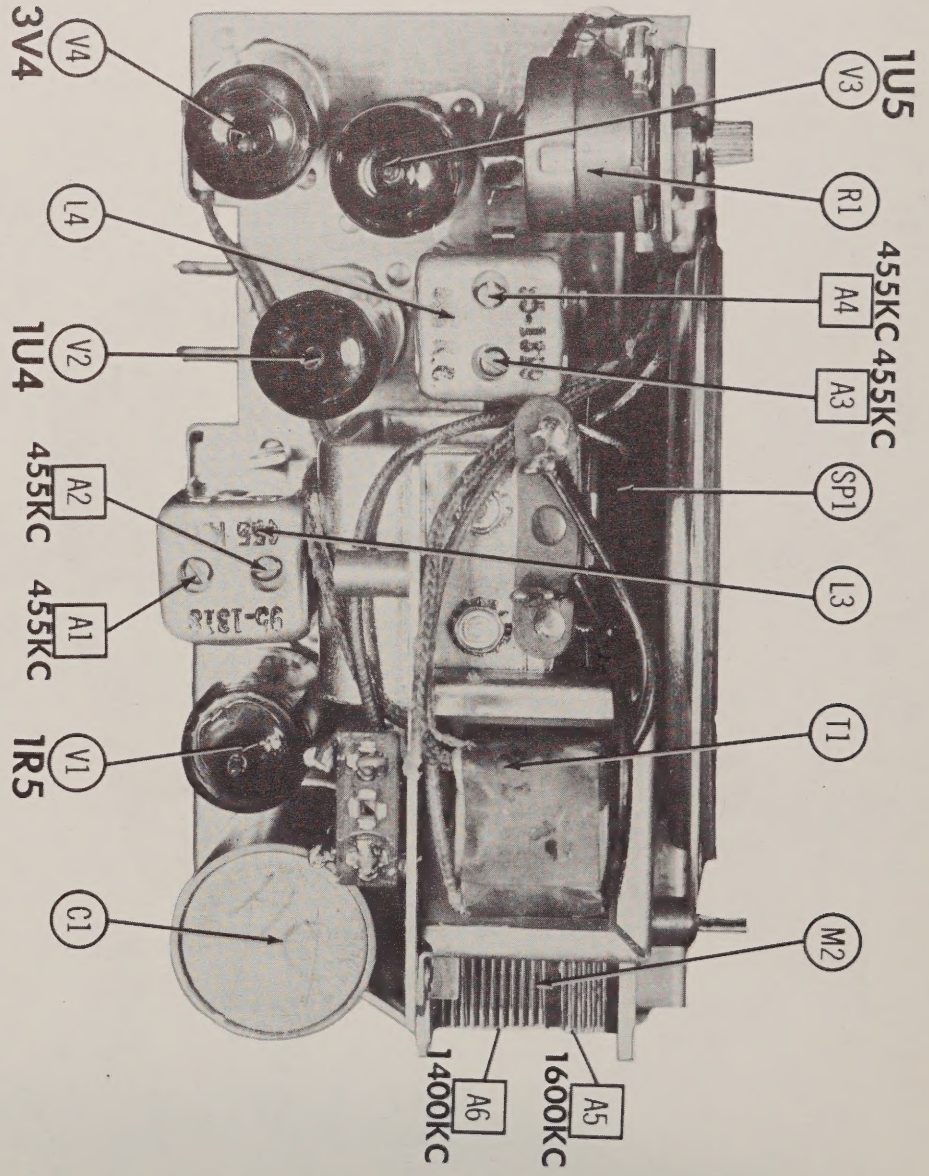
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R10	4.7Meg	½	63-1940	BTS-4.7Meg	
R11A	4.7Meg	½	♦105-31	BTS-4.7Meg	
B	1Meg	½		BTS-1Meg	
C	6.8Meg	½		BTS-2.2Meg	
R12	3900Ω	½	63-1810	BTS-3900	
R13	180Ω	4	63-2821		
R14	1000Ω	½	63-1785	BTS-1000	
R15	1750Ω	5	63-2819	1-3/4A-1750	

♦ Items R11A, R11B, R11C, C9A, c9B, C9C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	9KΩ	3.3Ω	515Ω	.54Ω SEC. 2 1.65Ω	206-724					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.3Ω	49-724	35J5	3A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ZENITH PART No.	MERIT PART No.	
L1	Loop Ant.	.4Ω		S-19135		
L2	Osc. Coil	1.8Ω	9.5Ω	S-19100		
L3	Input IF	17Ω	17Ω	95-1318	BC-352	
L4	Output IF	17Ω	17.5Ω	95-1319	BC-353	

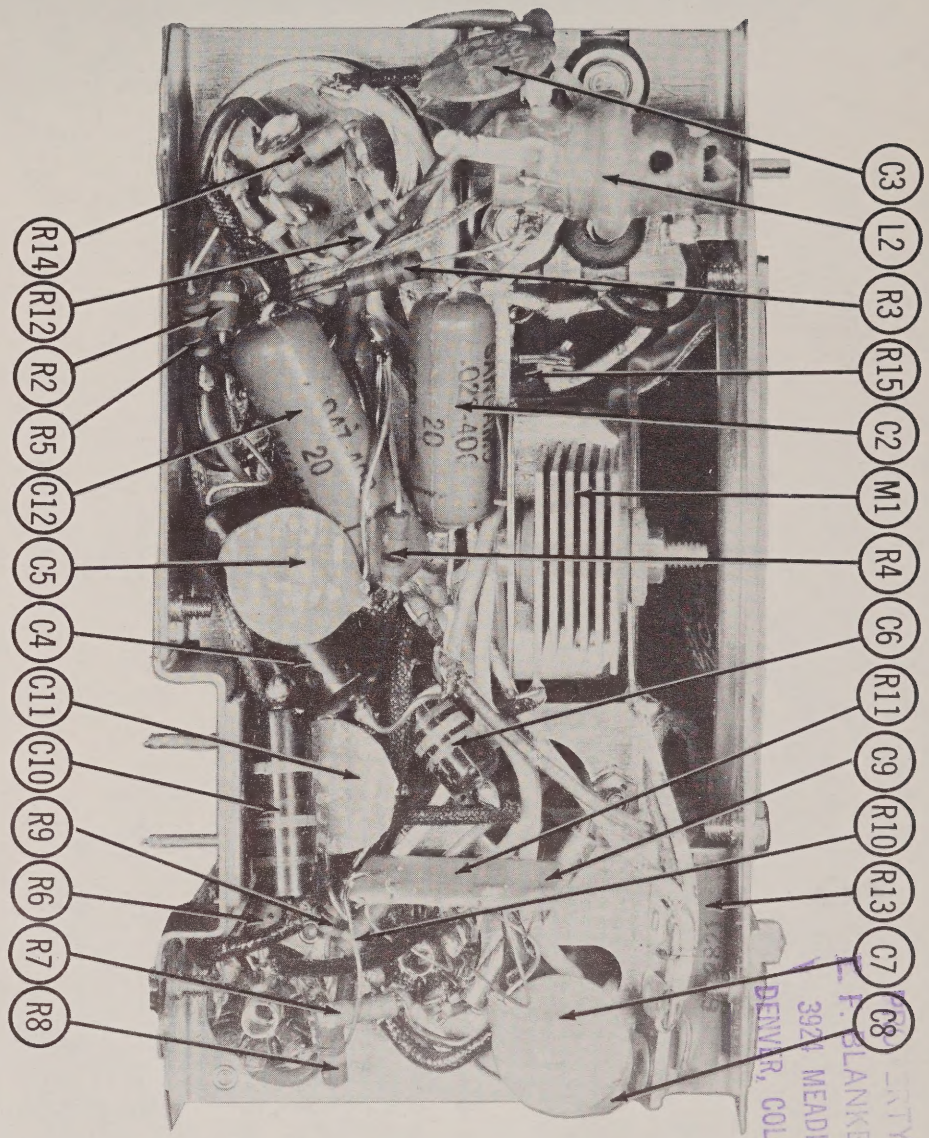
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	ZENITH PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.057	212-5	NB5	5M4	1003A	6S75	75

MISCELLANEOUS

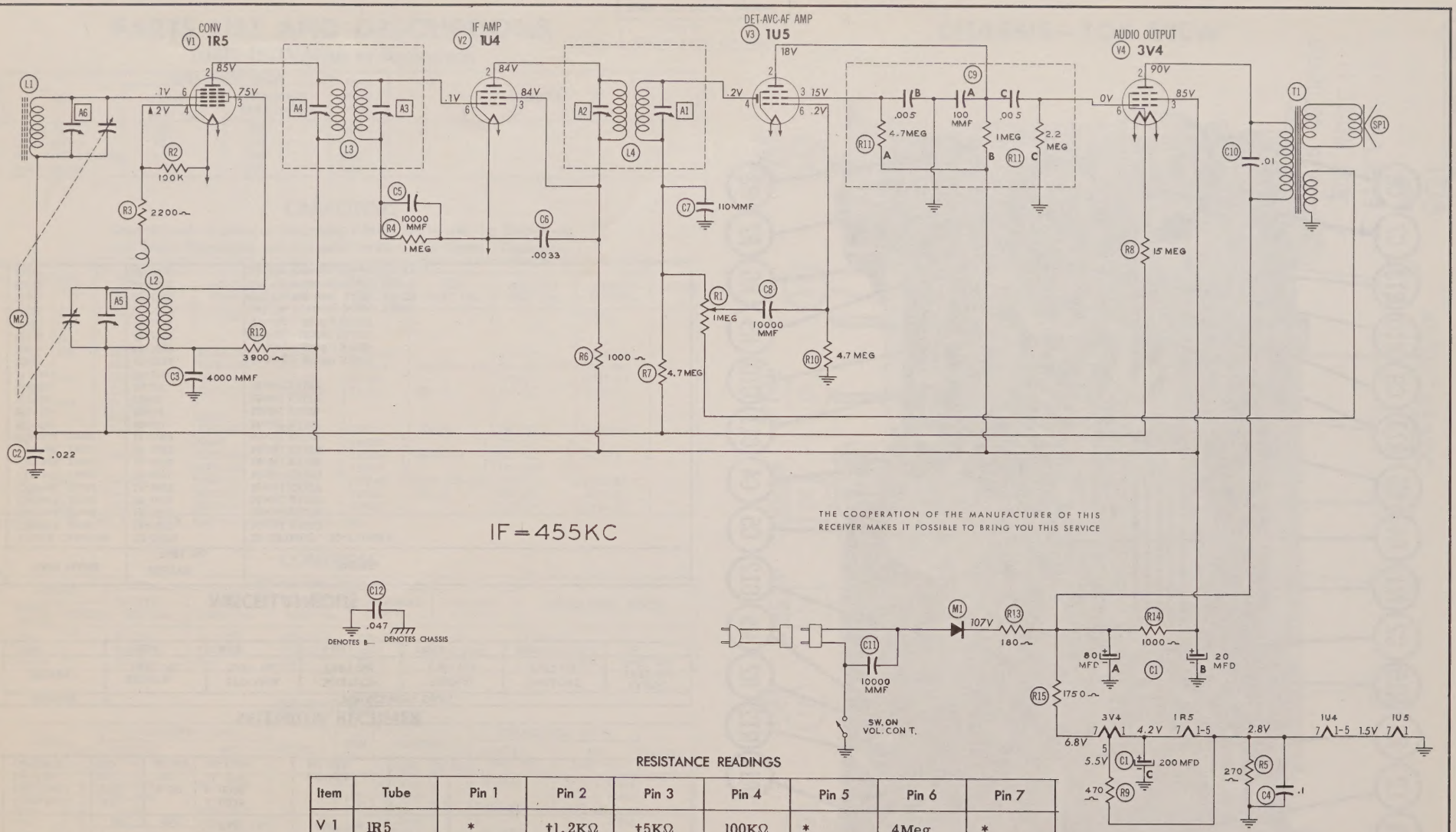
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	Tuning Capacitor	22-2425	30-288MMF, 20-100MMF
	Cabinet, front	14-1487	Model K412G
	Cabinet, front	14-1486	Model K412R
	Cabinet, front	14-1488	Model K412W
	Cabinet, front	14-1459	Model K412Y
	Cabinet, rear	14-1491	Model K412G
	Cabinet, rear	14-1490	Model K412R
	Cabinet, rear,	14-1492	Model K412W
	Cabinet, rear	14-1460	Model K412Y
	Handle	36-60	Model K412G
	Handle	36-59	Model K412R
	Handle	36-61	Model K412W
	Handle	36-56	Model K412Y
	Pointer	59-276	
	Knob	46-1033	Tuning - Model K412G
	Knob	46-1032	Tuning - Model K412R
	Knob	46-1034	Tuning - Model K412W
	Knob	46-1013	Tuning - Model K412Y
	Knob	46-1037	Off/On Volume, Model K412G
	Knob	46-1036	Off/On Volume, Model K412R
	Knob	46-1038	Off/On Volume, Model K412W
	Knob	46-1014	Off/On Volume, Model K412Y

CHASSIS—BOTTOM VIEW



CITY OF
F. P. BLANKENSHIP
3921 MEADE ST.
DENVER, COLORADO

ZENITH
MODEL K412G (Ch. 4K01)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†1.2KΩ	†5KΩ	100KΩ	*	4Meg	*
V 2	1U4	*	†2.2KΩ	†2.2KΩ	†2.2KΩ	*	1Meg	*
V 3	1U5	0Ω	†1Meg	†4.7Meg	800KΩ	800KΩ	4.7Meg	*
V 4	3V4	*	†695Ω	†1.2KΩ	4Meg	*	2.2Meg	*

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM OUTPUT OF M1
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953

195-13

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.